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The purpose of this study was to conduct a feasibility test of a 12-week church-based physical activity intervention that was culturally sensitive and age and gender specific that would affect attitudes of black adolescent girls that would increase participation in physical activity.

The design for this proposed study was a one-group pre- and post-test design. Black adolescent girls, ages 12-18, were recruited from two predominantly black churches in Durham, North Carolina. Paired *t*-tests and repeated measures of ANOVA revealed no significant changes in key variables. Positive changes were noted with Odds ratios on attitudes, self-efficacy and intention. BMI, METs, and fitness showed positive trends from pre to post intervention. Family support was significantly correlated with one measure of physical activity level.

Although, findings were not statistically significant, the intervention did create an interest in the girls for the need and continuation of physical activity. Conducting culturally tailored physical activity programs in black churches aimed at black adolescent girls are feasible and required to reduce the decline in physical activity during adolescence and the associated increases in obesity, high blood pressure and heart disease among this population.

A CHURCH-BASED INTERVENTION TO PROMOTE PHYSICAL
ACTIVITY IN BLACK ADOLESCENT GIRLS

By

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To my husband, Michael and my daughter, Michaela
Thank you for your love, support and continual encouragement.

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Philippians 4:13 – “I can do all things through Christ which strengthens me.”

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CHAPTER I

INTRODUCTION

Adolescence is a time when adoption of various health habits or behaviors is initiated. Interventions aimed at encouraging positive health behaviors during this time are essential and maybe more effective in this age group. Establishing healthy behavior, such as, regular physical activity during adolescence will help reduce risk factors associated with obesity and heart disease. Therefore, the purpose of this study was to test a 12-week church-based physical activity intervention for black adolescent girls, aimed at changing attitudes that would result in a significant increase in physical activity. The goal was to test a program that was culturally sensitive and age and gender specific that would affect attitudes of black adolescent girls that would lead to increased participation in physical activity.

Background and Significance of the Problem

Death rates in the United States from chronic diseases such as heart disease, obesity, hypertension and diabetes continue to be disproportionately higher in black women in comparison to white women (American Heart Association, 2009; National Heart, 2003). According to the latest statistics, the death rate from high blood pressure was 40.3% in black women, compared to 15.1% in white women. The prevalence of diabetes in black women is more than double that of white women at 14.2 % and 6.1%,

respectively; and black women have higher levels of being overweight and obese at 77.7%, compared to 57.5% in whites (AHA, 2009). There are a number of risk factors that contribute to these disturbing trends. However, physical inactivity has a strong association with many health conditions, such as diabetes, heart disease and obesity (AHA, 2009; Centers for Disease Control and Prevention, 2008a, 2008c; USDHHS, 2009). Table 1 shows the prevalence of chronic health conditions among women, which highlights the disparities noted between black women and other ethnic groups.

Table 1. Prevalence of Chronic Diseases in Women by Race (%)

Disease	White	Latino	Black
CVD	33.3	32.5	45.9
Stroke	3.2	3.8	4.1
High B/P	30.2	30.4	43.9
Overweight (BMI > 25.0)	57.5	73.0	77.7

Source: *Heart Disease and Stroke Statistics: 2009 Update at-a-glance* (AHA, 2009)

Physical inactivity is a major public health problem that contributes to increased morbidity and mortality due to its association with cardiovascular disease, obesity, diabetes, colon cancer, and high blood pressure (AHA, 2009; CDC, 2009c). It is estimated to cause 1.9 million deaths globally (WHO, 2008), and over 250,000 deaths annually in the United States (Meriwether, Lobelo, & Pate, 2008). In fact, physical activity is ranked as a leading health indicator by Healthy People 2010 (USDHHS, 2000).

Healthy People 2010 represent a comprehensive approach to understanding and addressing key health issues in the United States. By identifying physical activity as a leading health indicator, the United States recognizes the importance of physical activity in promoting the health and well being of people in this country. Key objectives for children and adolescents to improve levels of physical activity by the year 2010 can be seen in Table 2 (USDHHS, 2000; Wright, 2008). Worldwide physical activity levels are on the decline, and 60% of the world's population fails to complete recommended amounts of physical activity (WHO, 2008). In addition to the increased health risk and illnesses associated with physical inactivity, the economic burden of physical inactivity is significant.

Table 2. Healthy People 2010: Physical Activity Objectives for Children and Adolescents

Objective	Description	2010 Target
22-6	Increase the proportion of adolescents who engage in moderate physical activity for at least 30 minutes a day, 5 or more days per week.	35%
22-7	Increase the proportion of adolescents who engage in vigorous physical activity that promotes cardio-respiratory fitness 3 or more days per week for 20 or more minutes per occasion.	85 %
22-8	Increase the proportion of the Nation's public and private schools that require daily physical education for all students: a. Middle and junior high school b. Senior high school	25 % 5 %
22-9	Increase the proportion of adolescents who participate in daily school physical education.	50 %
22-10	Increase the proportion of adolescents who spend at least 50 percent of school physical education class time being physically active.	50 %
22-11	Increase the proportion of adolescents who view television 2 or fewer hours on a school day.	75 %
Access		
22-12	(Developmental) Increase the proportion of the Nation's public and private schools that provide access to their physical activity spaces and facilities for all persons outside of normal school hours (that is, before and after the school day, on weekends, during summer and other vacations).	----
22-13	Increase the proportion of worksites offering employer-sponsored physical activity and fitness programs.	75%
22-14	Increase the proportion of trips made by walking. a. Adults aged 18 years and older – 1 mile or less b. Children and adolescents aged 5 to 15 years - 1 mile or less	25% 50%
22-15	Increase the proportion of trips made by bicycling. a. Adults aged 18 years and older – 5 mile or less b. Children and adolescents aged 5 to 15 years – 2 mile or less	2.0 % 5.0 %

Source: (USDHHS, 2000)

The economic consequences of physical inactivity to society, as well as the cost to the individual, are substantial. The economic burden associated with physical inactivity includes increased physician visits, increased Medicaid and Medicare costs, and lost wages from work due to illness (CDC, 2009d; Trasande, Liu, Fryer, & Weitzman, 2009; USDHHS, 2002). Physical inactivity contributes to several chronic health problems, which substantially raise healthcare costs due to expenditures for physician care, drug costs, and rehabilitative services (CDC, 2009d; Trasande et al., 2009; USDHHS, 2002). In previous years, the annual cost directly related to physical inactivity in the United States was estimated at \$24 to \$76 billion. More recent data estimates that the cost of physical inactivity is over \$92.6 billion (CDC, 2009d; Trasande et al., 2009). Other costs associated with physical inactivity are lost wages from persons being unable to work due to illness and/or disability and lost benefits due to premature death (USDHHS, 2002). Studies show that physically active people have fewer hospital stays, less physician visits and use less medication than physically inactive people (2009c; CDC, 2009d; USDHHS, 2009). Improvement in physical activity could save billions of dollars (Trasande et al., 2009). Other economical benefits related to regular physical activity are increased productivity in the workplace, lower worker absenteeism and turnover, and better performance in school (CDC, 2009e; WHO, 2009b). Physical inactivity will become a greater financial burden to taxpayers and society as a whole, impacting businesses and local governments throughout the United States (CDC, 2008c). Effective measures and efforts to increase physical activity are needed. Measures to reverse current trends in physical inactivity should be instituted.

Black adolescent girls have a higher prevalence of being physically inactive and are more likely to be obese in comparison to white adolescent girls (CDC, 2010; Felton, Dowda et al., 2002; Kimm et al., 2006). A study by Kimm et al. (2006) revealed that physical activity in adolescent girls decreased significantly between pre-teen and teen years, with the prevalence of physical inactivity being higher in black adolescent girls compared to white girls. LaFontaine's (2008) study showed that physical activity levels in adolescent girls dropped from 41.6 % in 1991 to 33.0% in 2005, with 56 % of black adolescent girls not participating in any leisure-time physical activity. Accordingly, black adolescent girls were significantly less likely to participate in organized after-school activities than white girls (LaFontaine, 2008). In addition , only 21.9% of black adolescent girls participated in at least 60 minutes/day on 5 or more days in physical activity, and for all 7days it is drastically reduced to 10% (CDC, 2010). Consequently, this growing trend of physical inactivity among black adolescent girls contributes to many chronic health conditions (AHA, 2009; CDC, 2009c; USDHHS, 2002).

The Youth Risk Behavior Surveillance [YRBS] is a national school-based survey conducted by the CDC every 2 years to monitor priority health-risk behaviors that contribute to the leading causes of mortality, morbidity and social problems among youth (grades 9-12) and young adults in the United States (CDC, 2010). Four questions regarding physical activity are included on the YRBS survey. Table 3 shows the proportion of girls in 2007 and 2009 who did not participate in at least 60 minutes of physical activity on any day. The data shows that black adolescent girls had the highest inactivity among high school students (9th to 12th grade). The percentage of black

adolescent girls who were physically inactive in 2009 (CDC, 2010) increased from 2007 (CDC, 2008d), with some improvement noted in physical activity among Hispanic and white adolescent girls between this same time period.

Table 3. Did Not Participate in at Least 60 Minutes of Physical Activity on Any Day (%)

Female	2007	2009
Black	42.1 %	43.6 %
White	35.2 %	30.5 %
Hispanic	28.2 %	25.4 %
Youth Risk Behavior Surveillance (YRBS) – United States (CDC, 2008d & 2010)		

Disturbingly, this growing trend of physical inactivity among black adolescent girls places them at increased risk of chronic health conditions, contributing to higher incidences of mortality as they move into adulthood (CDC, 2008a; USDHHS, 2002). Overweight adolescents have a 70% chance of becoming overweight adults (AHA, 2009; Daniels et al., 2005). Consequently, high blood pressure and dyslipidemia are on the rise in adolescents, and type-2 diabetes, a disease usually diagnosed in adults' ages ≥ 40 , is being increasingly diagnosed in overweight adolescents (American Diabetes Association, 2000; AHA, 2009; The SEARCH for Diabetes, 2007). Other diseases in adolescence associated with being physically inactive are asthma, sleep apnea and psycho-social problems (Lemmon, Ludwig, Howe, Ferguson-Smith, & Barbeau, 2007; Weight

Awareness, 2004). Improving physical activity levels could significantly reduce health risks associated with these diseases.

The federal government recently released the *2008 Physical Activity Guidelines for Americans* that provide the amount, type, and intensity of physical activity needed to achieve health benefits for Americans across the life span (CDC, 2008c; Dishman, Washburn, & Heath, 2004; USDHHS, 1996; 2009). These recommendations are defined as aerobic and muscle-strengthening activities aimed at improving one's health. The recommendations for children and adolescents include performing 3 types of activity each week, aerobic, muscle-, and bone-strengthening. The recommendations are summarized as follows:

- Aerobic should consist of 60 minutes (1 hour) daily with most of the 60 minutes aimed at either moderate or vigorous intensity at least 3 days a week.
 - a. *Moderate intensity* is defined as working hard enough to raise your heart rate and break a sweat (USDHHS, 2009).
 - b. *Vigorous intensity* aerobic activity means one is breathing hard and fast, and your heart rate has gone up quite a bit, at this level you will not be able to say more than a few words without pausing for a breath (USDHHS, 2009).
- Muscle strengthening activities should be done at least 3 days a week, such as push-ups, resistance exercises with exercise bands and/or weights, rock climbing or sit-ups.
- Bone-strengthening physical activities should occur at least 3 days of the week, such as hopping, skipping, jumping rope, running and gymnastics to name a few.

Statement of the Problem

Disturbingly, black adolescent girls have a higher prevalence of being physically inactive in comparison to boys and girls of other ethnic groups (CDC, 2010; 2002; Kimm et al., 2002). Efforts to reverse this devastating trend are needed. Black adolescent girls require education to increase awareness of the importance of regular physical activity in maintaining and improving their quality of life. Research shows that regular physical activity is essential and beneficial in reducing the risk for strokes, heart attacks and diabetes (CDC, 2008c; 2009e; USDHHS, 2004; 2009). Other benefits include weight management (CDC, 2008c; 2009e; USDHHS, 2003), healthy bones and joints (Kohrt, Bloomfield, Little, Nelson, & Yingling, 2004) and reduced symptoms of anxiety and depression (Physical Activity and Depression, 2007). Despite the well-documented benefits of regular physical activity it is still on the decline (CDC, 2009e; Physical Activity and Depression, 2007; Saksvig et al., 2007).

Most interventions to increase physical activity have been effective, though few include blacks as participants, and few studies are designed specifically for black girls (Bopp, Lattimore et al., 2007). Effective intervention programs are required to address the epidemic of physical inactivity, especially in black adolescent (ages 12-18) girls. In reviewing the literature on physical activity, few studies include blacks and even fewer were conducted with black adolescent girls (Baggett et al., 2008; Biddle, Whitehead, O'Donovan, & Nevill, 2005; Gortmaker et al., 1999; McKenzie et al., 2004; Neumark-Sztainer, Story, Hannan, & Rex, 2003; Pate et al., 2007; Webber et al., 2008). A key focus for many intervention studies aimed at children and adolescent is school-based

approaches due to accessibility of students, and the availability of existing facilities and physical education faculty to help teach and promote the programs (Beets, Beighle, Erwin, & Huberty, 2009; Neumark-Sztainer et al., 2003; Pate et al., 2005; Robbins, Gretebeck, Kazanis, & Pender, 2006; Young, Phillips, Yu, & Haythornthwaite, 2006). Unfortunately, school-based behavioral interventions aimed at adolescents have not resulted in significant changes in physical activity levels (Robbins et al., 2006; Wilson et al., 2005; Young, Johnson et al., 2006).

Effective physical activity interventions are greatly needed to address physical inactivity among Black adolescent girls. Evidence has established that physical activity is an important behavioral characteristic for health promotion and disease prevention (CDC, 2009e; Robbins et al., 2006; USDHHS, 2002; 2009; Wilson et al., 2005; WHO, 2009b; Young, Johnson et al., 2006). Health promotion is strongly associated with personal lifestyles and involves two main processes: *stopping* negative or unhealthy behaviors and *starting* positive behaviors such as regular exercise or smoking cessation (Nahas, Goldfine, & Collins, 2003). Physical activity is a social and self-regulated behavior that is dependent upon the individual's effort to perform. In other words, the reason an individual chooses to engage or not to engage in physical activity is largely due to one's behavior or attitude toward the behavior.

Fostering physical activity in adolescence can establish healthy habits that could carry over into adulthood. Adolescence is a period of transition in which health habits and beliefs are adopted (Melnyk & Weinstein, 1994; Steinberg & Morris, 2001). Adopting and maintaining physical activity levels during adolescence is critical for

establishing healthy attitudes and behaviors in adulthood. Several studies have indicated that physical activity levels in adolescence correlated with higher or sustained physical activity levels in adulthood (Baggett et al., 2008; Kvaavik, Tell, & Klepp, 2003; Matton et al., 2006). Therefore, black adolescent girls should be exposed to and have access to physical activity programs within their communities to help foster healthy habits and lifestyle choices across their lifespan.

Assumptions

A key assumption of this study was that behavior established in adolescence is maintained through adulthood. Adolescence is a critical developmental period to foster healthy lifestyle choices through behavioral interventions, such as engaging in recommended physical activity. A second assumption was that intentions mediate the effect of attitudes toward physical activity participation.

The Theory of Reasoned Action

The Theory of Reasoned Action was the guiding framework for this feasibility study. The theory hypothesized that an individual's intention to engage in a given behavior is the most immediate predictor of that behavior (Montano & Kasprzyk, 2002). The Theory of Reasoned Action suggests that the construct intention mediates the effect of attitude and subjective norms toward behavior (Hagger, Chatzisarantis, & Biddle, 2002).

Research Hypotheses

The primary goal was to conduct a feasibility test of a program that was culturally tailored and age and gender specific that would change attitudes of black adolescent girls toward increased participation in physical activity. As part of this aim, a process evaluation of the program was conducted at the end of the program.

Hypothesis: Participation in the program will increase positive attitudes towards physical activity and greater intentions to engage in physical activity among black adolescent girls and result in:

1. Higher attitude scores from pre- to post- intervention.
2. Improved self-efficacy from pre- to post- intervention.
3. Increased enjoyment of physical activity from pre- to post- intervention.
4. Increased intention from pre- to post- intervention.

The secondary goal was to examine the extent to which participation in the program increased black adolescent girls' participation in physical activity and physical fitness.

Hypothesis: Participation in this program would increase physical activity levels and physical fitness among black adolescent girls, resulting in:

5. An improvement in physical activity levels of black adolescent from pre- to post-intervention.
 - a. There would be an increase in the level of daily physical activity assessed by number of steps walked per day as measured by the pedometer from week 2 to week 8 of the intervention.

- b. There would be an increase in fitness ($\text{VO}_2 \text{ max}$) as estimated by the Polar heart monitor across 3-time points: pre-, midpoint and post-intervention (1, 6 and 12 weeks) in black adolescent girls participating in the study.
6. There would be a decrease in body mass index (BMI) across 3-time points: pre-, midpoint and post-intervention (1, 6 and 12 weeks) in black adolescent girls participating in the study.
7. Perceived expectations of others and social support would be positively correlated with physical activity levels among black adolescent girls.

Conceptual Definitions

The words physical activity and exercise are often used interchangeably. However, there are distinct differences between these terms. The terms that relates to physical activity that were used throughout this study are defined below:

1. *Physical activity* was defined as bodily movement produced by the contraction of skeletal muscle that increases energy expenditure above the basal level (CDC, 2008b; USDHHS, 2009). Physical activity can involved a variety of activities, such as household chores, walking, dancing, job-related duties, playing, sports, and hobbies. Self-report was used to assess and measure physical activity levels.
 - a. *Moderate physical activity* (MPA) – engaging in physical activity at least 30 minutes a day, 5 or more days per week. MPA burns 3 to 6 METs with visible signs of increased breathing and a rise in one’s heart rate, such as walking, bicycling or mowing the lawn (CDC, 2008b).

- b. *Vigorous physical activity* (VPA) – engaging in physical activity that promotes cardio-respiratory fitness 3 or more days per week for 20 or more minutes per occasion. VPA burns greater than 6 METs, with significant visual changes, such as breathing hard or “breaking a sweat” (CDC, 2008b).
- 2. *Exercise* was defined as physical activity that is planned, structured, repetitive, and designed to improve or maintain one or more components of physical fitness (CDC, 2008b; Welk, 2002). Exercise was continuous structured activities performed at set times, such as going to the gym everyday at 6:00am.
- 3. *Leisure-time physical activity* encompassed physical activities performed during free time other than work or school such as, recreational and/or exercises (Dishman, Washburn et al., 2004; USDHHS, 1996; Welk, 2002).
- 4. *Physical inactivity* was participating in physical activity less than 30 minutes, on at least five or more days per week as recommended by Healthy People 2010 (CDC, 2008c; Dishman, Washburn et al., 2004; USDHHS, 1996).
- 5. *Physical fitness* – a set of attributes related to a person’s ability to perform activities with vigor and alertness, without undue fatigue, and with ample energy to enjoy and complete activity (CDC, 2008b). Physical fitness components included cardiorespiratory fitness, strength, flexibility, and body composition.
- 6. *Adolescent* – Although the CDC and the WHO define adolescence as encompassing the ages 10 to 24, for the purposes of this study adolescents will range in age from 12 to 18 years (MacKay & Duran 2008; WHO, 2009a).

7. *Attitude* - Attitude was defined in the dictionary as 'a mental position with regard to a fact or state' (Webster, 1993, p. 75). Attitude was a function of the belief that participation in physical activity will result in certain outcomes, with either positive or negative consequences. Attitude toward physical activity reflected a person's positive or negative evaluation of engaging in physical activity (Ajzen & Fishbein, 1980; Hagger et al., 2002).
8. *Behavior* for this study was participation and involvement in physical activity.
9. *Self-efficacy* was the confidence level or belief perceived by an individual that he/she can successfully engage in a given behavior (Bandura, 1977). Individuals were sure that they could and would succeed when faced with obstacles or difficulties. The major dimension of self-efficacy was overcoming barriers to physical activity.
10. *Intention* related closely to goals and implied an individual's desire to perform or accomplish a behavior. It reflected the degree of planning and effort that an individual directs toward designated behavior (Hagger & Chatzisarantis, 2008); what one has in mind to do or bring about.
11. *Subjective norm* was the perceived social pressure to engage or not to engage in a behavior.
12. *Enjoyment* in this study was focused on the fun and joy of participating in physical activity. The dimensions of enjoyment consisted of the feelings of good or bad, fun or not fun, and exciting or boring.
13. *Social support* was defined as any activity on the part of one person which resulted in aid or assistance of another person toward reaching a goal (Bruhn & Philips, 1984). It

was described as a concept that implies the helpfulness of social relationships (family, friends, peers and co-workers). If the social support was helpful it enhanced health and well-being (Bruhn & Philips, 1984). The focus was on the individual perception of perceived support from significant others.

14. *Goal setting* involved establishing realistic and attainable outcomes for performing a target behavior. These goals influenced behavior through persistent effort, effective strategies and mobilization of effort to achieve the goal (Locke & Latham, 2002).

Summary

Physical inactivity is a major public health problem that contributes to increased morbidity and mortality due to its association with several chronic diseases. The prevalence of physical inactivity is highest in black adolescent girls as compared to other ethnic groups, which places them at risk for obesity, high blood pressure and diabetes. The literature provides very few studies conducted with black adolescent girls regarding physical activity. The few studies that have been conducted were not designed specifically for black adolescent girls, which contributed to the lack of effective programs for this population. The growing epidemic of physical inactivity among black adolescent girls cannot be addressed without effective studies being conducted among this population. Without immediate attention to this problem, black adolescent girls are at risk of serious health problems that would continue into adulthood, thereby increasing their mortality rates. Improving black girls' health through increased physical activity in adolescence may result in their better overall health in adulthood. Interventions aimed at increased

physical activity among black adolescent girls would significantly improve health outcomes of black women. It stands to reason that healthy black adolescent girls then would grow into healthy black women

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

A report by the American Heart Association (2009) and the U.S. Department of Health and Human Services (2009) emphasized the importance of regular physical activity in the prevention of chronic diseases and overall good health. Research studies support that all individuals can benefit from regular physical activity (Centers for Disease Control & Prevention [CDC], 2003 & 2008a; DHHS, 2002; World Health Organization [WHO], 2008b). Despite this information, participation in physical activity is declining, especially in black adolescent girls (Council on Sports, 2006; Kimm et al., 2002; Levin, 2003; Neumark-Sztainer et al., 2003).

In considering conceptual frameworks to guide this study, several behavior theories such as the Theory of Reasoned Action, Social Cognitive Theory, and the Health Belief Model that focus on the importance of similar cognitive factors in directly or indirectly influencing health behaviors were considered (Glanz, Rimer, & Viswanath, 2008). However, because the primary focus of this study was on changing attitudes of black adolescent girls toward physical activity, the Theory of Reasoned Action (TRA) was identified as the conceptual framework most pertinent to the outcome of this study.

The TRA is a social cognitive theoretical framework that has been identified as particularly efficacious in explaining people's physical activity behavior (Hagger et al., 2002).

A brief overview of developmental characteristics associated with adolescent girls is discussed. The TRA as the guiding framework for this study is reviewed. Key predictors of physical activity identified in the literature, such as self-efficacy and enjoyment are discussed. In addition, previous intervention studies conducted with adolescent girls are considered, as well as the rational or importance of incorporating culturally sensitive strategies into intervention studies.

Puberty

Adolescence is defined as the period of transition from childhood to adulthood (Carswell & Stafford, 2008). The age range for adolescence in this study was between 12 to 18 years of age. Physical growth and development occur during the period known as puberty. Puberty results in dramatic physical and development growth. Biological, emotional, and behavioral changes are common occurrence during this period. In young girls the onset of puberty results in breast development and the occurrence of menarche. Research indicates that the onset of puberty is seen earlier in black girls than White girls, with the mean onset of breast development at 8.9 years in blacks and 10 years for whites (Carswell & Stafford, 2008). Adolescents tend to be preoccupied with body image and may be ambivalent about some of these body changes. This early onset of puberty may explain some of the disparity in physical activity among black girls; however, no studies

have been conducted in this area. Puberty is marked with changes in weight and body composition and the completion of skeletal growth (Stang & Story, 2005). Changes in weight and body composition vary between boys and girls (Stang & Story, 2005).

Average weight gain during puberty for girls is between 15-55 pounds, with a mean gain of 38.5 pounds. With the onset of menarche, weight gain slows (Carswell & Stafford, 2008). Girls' body composition changes more significantly during puberty with a 120% increase in body fat.

Psychosocial and cognitive development is heightened during adolescence. Cognitive abilities are dominated by concrete thinking, egocentrism, and impulsive behavior in adolescents (Carswell & Stafford, 2008). Adolescence signals the beginning of the development of a personal identity, including recognition of a set of personal moral and ethical values, and greater perception of feelings of self esteem or self worth (Stang & Story, 2005). Health behaviors which could affect future health status are initiated during adolescence. Adolescent girls require knowledge to help make appropriate health related choices in order to promote healthy outcomes and lower incidence of chronic disease in adulthood.

Theoretical Framework

The Theory of Reasoned Action (TRA) by Fishbein and Ajzen is based on the premise that behavior is the result of a “*reasoned*” process, assuming that people have beliefs about the performance of behaviors, and they use these beliefs to decide whether or not to perform them (Ajzen, Albarracin, & Hornik, 2007). The TRA maintains that the

most important determinant of behavior is a person's *behavioral intention*, which is determined by their *attitude* toward performing the behavior and their *subjective norm* associated with the behavior (Ajzen & Fishbein, 1980; Montano & Kasprzyk, 2002). Subjective norms are perceived social pressures to participate or not to participate in a behavior. A person's *subjective norm* is determined by his or her normative beliefs (Montano & Kasprzyk, 2002). In essence, a person considers the opinions or wishes of others in making decisions to perform or not to perform a behavior.

Normative beliefs are the perceived expectations of significant others in a person's life, what a person believes or thinks others want her to do (Ajzen et al., 2007; Montano & Kasprzyk, 2002). In other words, the person's perception that most people who are important to her think she should or should not perform the behavior in question. These significant others may include friends or a peer group, family, spouse, co-workers, church congregation members, community leaders and even celebrities (Boss, Ciccolo, Whitehead, King, & Bock, 2009)

Beliefs are the concepts or ideas (behavioral) that a person develops based on personal experiences, knowledge or lack of knowledge, skills and abilities, perceptions, cognitive predictor (self-efficacy) and affective predictors (enjoyment). These behavioral factors affect how a person reaction or response to certain behaviors (Ajzen & Fishbein, 1980).

Attitude is a concept that is amenable or modifiable to change. In order to understand and change attitudes it is important to know what components form attitudes. The three essential components of attitudes are cognitive (what you think), affective

(what you feel) and behavioral (what you do) (Rosenberg & Hovland, 1960). Cognitive components of attitude are shaped by knowledge or lack of knowledge toward a behavior or action. Affective components of attitude are shaped by pleasant or unpleasant stimuli (enjoyable or painful), and behavioral components of attitude is the result of intention to perform or not to perform (Ajzen & Fishbein, 1980; Rosenberg & Hovland, 1960). Ajzen and Fishbein (1980) describe attitude as a function of the belief that participation in a behavior will result in certain outcomes, as well as the evaluation or value of these outcomes as having positive or negative consequences.

Attitude toward the behavior is determined by the individual's belief about the outcomes or attributes of performing the behavior (behavioral beliefs) weighted by evaluations of those outcomes or attributes (Montano & Kasprzyk, 2002, p. 70). Therefore, if a person feels strongly about physical activity due to increased physical fitness or mobility, then that person will have a positive attitude toward being physically active. Attitude is a strong predictor of intention (Deforche, De Bourdeaudhuij, & Tanghe, 2006).

Intentions are influenced by social expectations (subjective norm), individual attitudes, and perceptions of control and are believed to be the strongest predictor of behavior (Ajzen & Fishbein, 1980; Dishman et al., 2006). How hard an individual is willing to try, or how much of an effort one is planning to exert to perform a behavior are indications of intentions. An individual engagement in an established behavior is directly linked to the strength of the intention (Martin et al., 2005). A person who has a favorable attitude toward a behavior is more likely to have strong intention than a person who has

an unfavorable attitude. Studies have shown that attitudes toward physical activity is an important predictor for engaging in physical activity (Ciccomascolo & Grossi, 2008; Deforche et al., 2006; Grieser et al., 2006; Hagger, Chatzisarantis, & Biddle, 2001; Lewis-Moss, Paschal, Redmond, Green, & Carmack, 2008). Clearly, understanding and addressing attitudes of black adolescent girls may lead to increased intention to be more physically active. The constructs of the TRA were identified as: attitudes, beliefs (shaped by knowledge, self-efficacy and enjoyment), subjective norms (perceived influence from family and friends), intention and behavior (physical activity). The review of the literature was organized according to these five constructs.

Attitude

Black girls' experiences and perceptions play a major role in determining their participation in regular physical activity. A person's attitude is shaped by his/her experiences, beliefs and cultural influences (Ajzen et al., 2007; Boyington et al., 2008). Ajzen and Fishbein (1980) describe attitude as a function of the belief that participation in a behavior will result in certain outcomes, as well as the evaluation or value of these outcomes as having positive or negative consequences. Authors have reported that attitude toward physical activity is an important predictor of engaging in physical activity (Ciccomascolo & Grossi, 2008; Deforche et al., 2006; Grieser et al., 2006; Hagger, Chatzisarantis, & Biddle, 2001; Lewis-Moss et al., 2008). Attitude is a function of the belief that participation in physical activity results in certain outcomes, reflecting a person's positive or negative experiences (Deforche et al., 2006; Hagger &

Chatzisarantis, 2008). Therefore, understanding and addressing attitudes of black adolescent girls may lead to increased intention to be more physically active.

Qualitative findings of black adolescent girls' attitudes toward physical activity from previous studies (Boyington et al., 2008; Mabry et al., 2003; Ries, Voorhees, Gittelsohn, Roche, & Astone, 2008; Vu, Murrie, Gonzalez, & Jobe, 2006) were summarized under four themes: Appearance and image, stereotypes, cost and parental influence.

Appearance and Image

Previous research has indicated that black girls do not view weight as a health problem and these girls have a different view of body image than non black girls (Alleyne & LaPoint, 2004; Ciccomascolo & Grossi, 2008). Hence, weight loss as a potential outcome of physical activity may not be an effective motivator for black adolescent girls. Thus, an intervention was focused on increased fitness or improved health rather than weight management.

An analysis of obesity among black adolescent girls conducted by Alleyne and LaPoint (2004) documented that black girls had a more tolerant attitude toward being a little overweight, referring to themselves as thick, and believing big-is-beautiful. Although this attitude indicates a more positive self-image, it negates the need to engage in regular physical activity. Results from a qualitative study by Boyington et al. (2008) and Mabry et al. (2003) revealed the same findings that Black women preferred and tolerated heavier body weight and were more satisfied with their body image and large

body size. A common statement in the Boyington et al. (2008) study was '*I am big, but not fat*' (p.3); therefore, not seeing the need to exercise or be physically active. In a study by Dietz (2001), the perceptions of overweight were viewed as eating too much or eating a lot of sugary foods, the term obesity was only applied to people who weighed more than 300 pounds, exercise was for people who wanted to lose weight, and black girls were less concerned about weight. Black girls have a broader concept of beauty than their white peers (Mabry et al., 2003).

Other attitudes expressed by black adolescent girls centered on personal appearances. An early study by Taylor and colleagues (2000) revealed that black adolescent girls viewed physical activity as an unpleasant experience that messed up their hair and make-up. Therefore, they were less likely to be physically active. In fact, black hair care needs and issues were a consistent concern noted in several studies (Boyington et al., 2008; Dietz, 2001; Taylor et al., 2000). Many girls did not participate in physical activity during school hours due to inadequate time to shower and change (Boyington et al., 2008; Dietz, 2001; Mabry et al., 2003; Taylor et al., 2000). Some girls, feeling self-conscious, did not like the idea of changing in front of others, while others did not like the feeling of being sweaty (Boyington et al., 2008; Grieser et al., 2006). Some girls felt embarrassed in front of boys due to poor performance of a skill and did not like being laughed at (Boyington et al., 2008; Grieser et al., 2006).

Stereotypes

A common theme that emerged in several studies was negative stereotypes regarding being physically active. Some girls felt that being physically active meant being less feminine, stating only tomboys engaged in physical activity or sports (Grieser et al., 2008; Mabry et al., 2003; Vu et al., 2006). Being less attractive to boys was a concern voiced by some girls (Grieser et al., 2006; Vu et al., 2006), and some girls did not like to be taunted and teased by boys during physical education classes, which contributed to their lack of participation in activities (Vu et al., 2006). However, girls who were more active viewed inactive girls as *lazy* or *fat* (Vu et al., 2006, p. 88). In the Vu et al. (2006) study, black adolescent girls were the majority (n=40%).

Cost

The idea of cost relates more to time management and setting priorities. Time constraints and convenience were also viewed as factors that determine physical activity levels (Felton, Boyd, Bartoces, & Tavakoli, 2002). Physical activity was viewed as less important in comparison to completing homework assignments and spending time with friends (Mabry et al., 2003). Financial costs are considered when dealing with the care and maintenance of Black hair. Hair maintenance is a major issue with Black adolescent girls, verbalizing that physical activity was not worth the amount of time and money to re-do their hair (Dietz, 2001; Taylor et al., 2000). Although many girls understood the benefits of being physically active, the health consequences or cost, such as heart disease and loss of mobility, was of little concern to them.

Parental Influence

Parents' attitudes toward physical activity can play a critical role in affecting the perception and attitude of black adolescent girls toward physical activity. Many adolescents model their health habits from their parents. Therefore, it is vital for parents to be a role model and promoter of positive health habits such as engaging in regular physical activity. Studies have shown that parental influence is an important factor in the promotion of physical activity in black adolescent girls (Bauer, Nelson, Boutelle, & Newmark-Sztainer, 2008; Lewis-Moss et al., 2008). Parents can have a major influence on physical activity levels through being a positive role model and having a positive attitude about physical activity. Girls who were physically active spoke of the importance of family support and encouragement in their decision to be active (Kuo, Voorhees, Haythornthwaite, & Young, 2007; Mabry et al., 2003; Ries, Voorhees et al., 2008). Developing and enhancing positive attitudes toward physical activity may lead to increased physical activity among black adolescent girls. The TRA states that attitudes, in addition to subjective norms, determine behavioral intent (Shen, McCaughtry, & Martin, 2008).

Self-Efficacy

Self-efficacy, a central tenet in Social Cognitive Theory (SCT), is defined "as individual's judgment of his or her capabilities to organize and execute courses of action" (Resnick, 2008, p. 183). Although self-efficacy is a central tenet of the SCT, it is a concept that will be considered in this study due to its strong predictive value regarding

physical activity (Marcus, Selby, Niaura, & Rossi, 1992; Srof & Velsor-Friedrich, 2006; Wu & Pender, 2002). Self-efficacy is a concept that can stand alone, and is a component of a person's beliefs and self-perception which affects attitudes (Resnick, 2008). Therefore, the implication of self-efficacy on attitudes will be an important factor to consider in this study.

Self-efficacy is considered the most powerful and proximal cognitive predictor of behavior, including physical activity (Bandura, 1977; Baranowski, Perry, & Parcel, 2002). Self-efficacy is believed to affect individuals' behavior choices, effort, persistence, and achievement (Bandura, 1977). Self-efficacy is tied to one's beliefs about personal abilities and it is an important factor in promoting physical activity in adolescent girls, especially on intention to be physically active (Motl et al., 2002). In a study by Motl et al. (2002) self-efficacy was found to be related to moderate and vigorous physical activity and it accounted for the effect of intention on physical activity. Self-efficacy predicts *intentions* to engage in healthy behavior, and is a significant factor in predicting physical activity (Marcus et al., 1992; Srof & Velsor-Friedrich, 2006; Wu & Pender, 2002). In fact, self-efficacy, in a study by Wu and Pender (2002) was the strongest predictor explaining 19% of the variance in physical activity. A girl's confidence level or perceived self-efficacy have shown to have a direct effect on participation in physical activity.

Self-efficacy implies that one's confidence level in performing a task influences the direction, intensity, and persistence of a behavior (Bandura, 1977; Schwarzer & Fuchs, 1995). Self-efficacy beliefs are derived from four sources: (a) mastery experiences

(actually performing a task), (b) vicarious experiences (modeling), (c) social persuasion, and (d) physiological and emotional states such as anxiety, stress, arousal, and fatigue (Bandura, 1995). Vicarious experiences or modeling are an important influencing source for adolescent girls because peer support is vital during this stage of their development. Participation in physical activity is increased when girls observe other girls engaging in the activity. Therefore, a key influencing factor on adolescents' self-efficacy is a peer-supporting network (Schunk & Meece, 2006). A study by Beets, Pitetti, and Forlaw (2007) supported that peer influences were related to increased self-efficacy for overcoming barriers in adolescent girls toward physical activity. This study highlighted the importance of peers toward increasing self-efficacy that leads to increased activity levels among adolescent girls (Beets et al., 2007). A girl's own desire and confidence to achieve a goal is also important when committing to a task or change in behavior. Girls with a high sense of self-efficacy are more physically active, more competent in sports, and reported greater enjoyment of physical activity than girls with lower self-efficacy (Pender, Bar-Or, Wilk, & Mitchell, 2002; Robbins, 2004; Wu & Pender, 2002).

Self-efficacy is an effective predictor in the modification of behaviors, such as smoking cessation, weight loss, and exercise (Nahas et al., 2003). The more confidence a person has in their ability to change, the more likely it is that their behavior will change. Therefore, black adolescent girls' level of self-efficacy will be a key determinant in ensuring implementation and continuation of regular physical activity. A study aimed at examining the correlates of self-efficacy for physical activity in black women indicated that maintaining recommended levels of physical activity was positively associated with

high self-efficacy (Fallon, Wilcox, & Ainsworth, 2005). Despite barriers to physical activity, such as unsafe neighborhoods or lack of adequate facilities, a person with a high self-efficacy will persevere despite the difficulties (Allison, Dwyer, & Makin, 1999; Bandura, 2004). Conversely, a person with a low self-efficacy gives up very easily in the face of obstacles or conflict. Self-efficacy is not only important in behavior modification, it also is important in setting goals. Bandura (2004) believed that self-efficacy influences a person's goals and aspirations, as evidenced in this quote: "The stronger the perceived self-efficacy, the higher the goals people set for themselves and the firmer their commitment to them" (p. 145). Hagger and colleagues (2001) further illustrate this point in their study by demonstrating that young people with positive attitudes and high self-efficacy are more likely to form intentions to participate in physical activity as compared to young people with lower self-efficacy. The public health significance of physical inactivity among adolescent girls, especially black adolescent girls, emphasizes the importance of identifying mediators, such as self-efficacy that can be used to foster participation in physical activity (Dishman, Motl, Sallis et al., 2005).

Although the literature supports self-efficacy as an effective mediator for increasing physical activity, studies involving black adolescents are scarce. In the few studies that addressed self-efficacy and physical activity, only 9% or less of the sample size included black girls (Beets et al., 2007; Dzewaltowski et al., 2007; Robbins, Pender, & Kazanis, 2004). Thus, emphasizing the need for further studies of self-efficacy influences on black adolescent girls regarding physical activity. In addition to self-efficacy, studies have shown *enjoyment* as an influencing factor in adolescent girls'

increased participation and adherence to physical activity (Barr-Anderson et al., 2008; Dishman, Motl, Saunders et al., 2005; Grieser et al., 2008; Motl et al., 2001).

Enjoyment

Enjoyment can be defined or described as “a positive affective state that reflects feelings such as pleasure, liking and fun”(Scanlan & Simons, 1992, p. 203).

Accordingly, a person who enjoys an activity will continue to participate in that activity.

Girls with a positive attitude toward physical activity identified enjoyment as a key influencing factor in their decision to be active (Loman, 2008; Mabry et al., 2003).

Dishman et al (2005) provided experimental evidence from a randomized controlled trial that directly shows that increased enjoyment results in increased physical activity among adolescent girls. Other studies have shown that enjoyment positively predicted physical activity (Murcia, San Roman, Galindo, Alonso, & Gonzalex-Cutre, 2008; Robbins et al., 2004; Young, Johnson et al., 2006). Some researchers consider enjoyment essential to physical activity adherence (Nahas et al., 2003; Robbins, 2004). A conclusion may be drawn that physical activity interventions directed at adolescent girls need to be fun and enjoyable to increase participation. In a focus group of adolescent girls, Loman (2008), found that girls preferred the term “*physical activity*” over “*exercise*.” The girls felt that exercise was more of a *chore*, “something they don’t want to do,” as compared to physical activity as more “*fun*” activities (Loman, 2008, p. 297). Focus more on the fun and enjoyment of physical activity, and incorporate activities that girls typically enjoy such as aerobics, dance, walking, and self-defense. Measuring enjoyment may help in the

understanding of factors shown to contribute to physical activity adherence (Nahas et al., 2003; Robbins, 2004). Enjoyment has been identified as a key mediator for physical activity in other studies of adolescents (Dishman, Motl, Saunders et al., 2005; Nahas et al., 2003; Schneider & Graham, 2009; Young, Johnson et al., 2006). Furthermore, results suggest that for young people and physical activity, the formation of behavior plans or intentions is dominated by attitudes towards that behavior (Hagger, Chatzisarantis, & Biddle, 2001). Because intentions are influenced by attitudes, factors affecting attitude, such as environmental influences should be explored and understood as well.

Subjective Norms

Subjective norms are the perceived social pressure to engage or not to engage in a behavior (Hagger et al., 2002). Friends or a peer group, family, spouse, coworkers, church congregation members, community leaders and even celebrities can be influential in a person's life. These people are part of a person's environment which can be classified as either social or physical. The social environment consists of social support from family members, friends and peers. The physical environment includes one's community, neighborhood, church, and one's school. Studies have shown that subjective norms are important in increasing physical activity of black youths (Martin et al., 2005). A significant finding in a study by Martin et al. indicated that both attitude and subjective norm were predictive of intention for increasing moderate to vigorous physical activity in black children (Martin et al., 2005).

Social support has been demonstrated to be a predictor of health behavior (Beets, Vogel, Forlaw, Pitetti, & Cardinal, 2006; Reynolds et al., 1990; Sallis, Prochaska, & Taylor, 2000; Voorhees et al., 2005). Social support refers to the function and quality of beneficial social relationships (Heaney & Israel, 2002). It is intended to be helpful, and can be categorized into four broad types of supportive behaviors: emotional, instrumental, informational, and appraisal (Heaney & Israel, 2002). Expressions of empathy, love, trust, and caring represent emotional support. Encouragement to perform activities and praise associated with the performance are examples of emotional support for physical activity. Instrumental support consists of tangible aid and services, such as transportation and money (Heaney & Israel, 2002). Information support involves given advice or directives aimed at encouraging and facilitating effective coping or behavioral modification. Modeling of healthy behaviors would also be an example of information support. Information that is useful for self-evaluation, such as constructive feedback is representative of appraisal support (Heaney & Israel, 2002).

Social Environment

Social environment such as social support from parents can be essential in promoting and fostering physical activity in adolescent girls. As previously discussed under attitude, parents can have a major influence on adolescent girls' participation in physical activity. Studies show that girls whose parents are more supportive report more time being physically active than girls whose parents were not supportive (Adkins, Sherwood, Story, & Davis, 2004; Bauer et al., 2008; Sallis et al., 2000). Girls viewed

parents as the most important influence on their physical activity levels (Young, Johnson et al., 2006). A study by Kuo (2007) reported that family involvement and support for exercise may be an important predictor of physical activity among adolescent girls. Springer et al. (2006) showed that higher levels of family social support resulted in higher mean daily minutes of vigorous physical activity as compared with students with the lowest frequency of social support. The Springer et al. (2006) study highlights the importance of family support in reducing sedentary behavior in adolescent girls. Research supports that modeling of health behavior, such as physical activity by parents, may be the most effective strategy for the improvement of an adolescent's health behavior (Sallis et al., 2000). Family involvement is an essential resource for promoting a positive attitude toward physical activity among black adolescent girls (Felton, Dowda et al., 2002).

Physical Environment

A study by Moore and colleagues (2008) revealed that the lack of available recreational resources within the community contributed to the disparities of blacks being less physically active than whites. Environmental influences, such as poorly maintained or lack of facilities, and no programs available in black neighborhoods were 4.5 times more likely not to have recreational facilities in comparison to white neighborhoods (Moore et al., 2008). Environments within poorer neighborhoods were concerns of participants in other studies, as well (Council on Sports Medicine, 2006; Ries, Voorhees et al., 2008). Other environmental factors to consider are residential crowding, noise,

traffic congestion, and chronic exposure to community violence and crime (King, Bauman, & Abrams, 2002). Environmental factors such as recreational facilities, walking trails, and parks are limited or unavailable in low-income, minority neighborhoods (Moore et al., 2008). Moore and colleagues (2008) revealed that lack of availability of recreational resources within the community contributed to blacks being less physically active than whites. Black neighborhoods were 4.5 times more likely not to have recreational facilities in comparison to white neighborhoods (Moore et al., 2008). In a study by Ries et al. (2008), adolescents identified the following negative environmental influences that prevented or interfered with physical activity: lack of streetlights, poorly maintained facilities, trash and litter at parks and courts, and unsafe facilities and neighborhoods. Environmental influences such as poorly maintained or lack of facilities, and no programs available within poorer neighborhoods were concerns of black adolescent girls in other studies as well (Council on Sports Medicine, 2006; Ries, Voorhees et al., 2008). Physical activity levels were higher in adolescents who lived in neighborhoods with sidewalks, parks, YMCA, and other recreational facilities (Felton, Dowda et al., 2002). Black girls indicated their neighborhoods were too unsafe (e.g., heavy traffic, dogs, gangs) for walking, jogging and outside activity (Felton, Dowda et al., 2002). Girls who had access to physical activity facilities near their home were more likely to report higher levels of physical activity (Kuo et al., 2009; Ries, Voorhees et al., 2008). Therefore, improving access and availability of physical activity programs within the community may help increase black adolescent girls physical activity level. One solution to access may be utilizing churches within the community.

Intention

A study by Shen et al. (2008) explaining leisure-time physical activity intentions and behaviors in urban adolescents revealed that nurturing adolescents' autonomy and competence in physical education is important for enhancing leisure-time physical activity intentions and behaviors. A study by Dishman et al. (2006) also supported that intentions were an important factor in a girl's desire to change and increase physical activity levels. The study showed that goal setting and intention mediated the indirect relationship between self-efficacy and change in physical activity (Dishman et al., 2006). Studies have shown that intention toward physical activity in young people was dominated by attitudes (Hagger, Chatzisarantis, Biddle, & Orbell, 2001; Hagger, Chatzisarantis, & Biddle, 2001). A 2-week longitudinal study that was aimed at learning more about adolescents' motivations and intentions to perform two health behaviors that influence weight, eating and physical activity, found that attitudes did predict intentions (Baker, Little, & Brownell, 2003). This study highlighted the significant role of attitudes in health promoting behavior. Other studies have shown that intentions can predict behavior supporting a fundamental relationship between intention and behavior (Courneya & McAuley, 1993; Swanson, Power, Kaur, Carter, & Shepherd, 2006).

Behavior

Behavior changes during adolescence are a major factor in the transition from childhood to adulthood with physical, psychological, sociocultural, and cognitive maturity occurring during this period (DiClemente, Santelli, & Crosby, 2009). Health risk

behaviors are usually established during adolescence and extend into adulthood.

Unfortunately, this is the time when many adolescents elect to engage in risk behaviors that are harmful and may result in injuries to themselves or others. Health risk behaviors that are prevalent during adolescence are the use of alcohol, tobacco, and other drugs (DiClemente et al., 2009). In addition, early sexual behaviors are a risk factor for this age group leading to unintended pregnancy and sexually transmitted infections. Studies indicated that black adolescent girls initiate sex earlier and have higher incidence of pregnancies and sexually transmitted infections (Bachanas et al., 2002; CDC, 2009f). In fact, teen pregnancy among those aged 15-19, account for 11% of all births in the United States, with the highest teen pregnancy rate among black adolescent girls at 134 per 1,000 (CDC, 2009f).

It is essential that adolescents are given the opportunity to adopt healthy attitudes about risk behaviors and to develop healthy behavior, such as engaging in regular physical activity. Lifestyle behaviors of black girls are shaped by their personal health beliefs, attitudes, perceptions, and cultural influences (Boyington et al., 2008). Participating in appropriate health behaviors may influence the quality of health of an individual and may be the major predictor in a person living a long and healthy life.

Behavior is viewed as the actual ability to perform or participate in a desired activity or event (Baranowski et al., 2002). Behavior can be viewed at many levels and researchers interested in changing health behaviors must clearly specify their target behavior. For the purpose of this study the behavior is engaging in regular physical activity. Behavior adoption is enhanced through knowledge of the behavior and skill

level to perform behavior (Baranowski et al., 2002; Motl, 2007). A benefit to regular physical activity is improvement in health that can be measured by body mass index (BMI) and improved physical fitness.

Health (Body Mass Index and Physical Fitness)

Body mass index [BMI] in adolescents is age- and sex-specific and is calculated from a person's weight and height. It is a reliable indicator of body fatness for most people and may be used to screen for weight categories that may lead to health problems (CDC, 2009a). An increase in one's BMI can be associated with decreased levels of physical activity. A study by Kimm et al. (2005) showed the BMI levels of adolescent girls in the United States were significantly affected by declining levels of physical activity. In addition, race also is a factor in BMI changes. A study by Felton, Dowda et al. (2002) revealed that black adolescent girls had higher BMI than white adolescent girls. Research studies support that participating in regular physical activity will maintain or reduce BMIs. Hip-Hop to Health Jr, was a randomized controlled trial that was conducted over 2-years that showed physical activity was effective in reducing BMI (Fitzgibbon et al., 2005). Other studies have also shown that maintaining physical activity in childhood contributes to a lower BMI during early adolescence (Jamner, Spruijt-Metz, Bassin, & Cooper, 2004; Moore et al., 2003; Neumark-Sztainer et al., 2003).

Physical Fitness

A person's current level of physical activity influences or affects their physical fitness. Studies have shown that aerobic fitness in children and adolescents can be improved through regular physical activity (Ekelund et al., 2001). A study by Barbeau et al. (2007) revealed that even minimal participation in a physical activity programs by girls still resulted in improved cardiovascular fitness. Maintaining and ensuring physical fitness has shown a strong correlation in decreasing cardiovascular disease risk factors (Carnethon, Gulati, & Greenland, 2005). Physical activity interventions that results in improved fitness may be an important component in improving health outcomes. Therefore, previous physical activity interventions directed at adolescent girls will be reviewed.

Intervention Studies

Effective intervention programs are greatly needed to address the growing epidemic of physical inactivity, especially in black adolescent (ages 12-18) girls. Seven intervention studies directed at adolescent girls were identified in the literature that were conducted between 1998 and 2008 (Bayne-Smith et al., 2004; Neumark-Sztainer et al., 2003; Pate et al., 2005; Resnicow et al., 2000; Robbins et al., 2006; Stevens et al., 2005; Young, Phillips et al., 2006). Black or African American girls had to comprise at least 20% of the sample participants in order for the study to be included in the review. Seven intervention studies were identified that met these criteria. The research design was either randomized controlled trials or quasi-experimental designs. Five of the seven

interventions identified in the literature were school-based (Bayne-Smith et al., 2004; Neumark-Sztainer et al., 2003; Pate et al., 2005; Robbins et al., 2006; Young, Phillips et al., 2006), one intervention was community-based (Resnicow et al., 2000) and one was a combination of both school- and community-based (Stevens et al., 2005). School-based designs are the approach by the majority of these interventions. Many hours of a child's life are spent at school, thereby allowing programs or courses offered at school to potentially change or affect behavior habits regarding diet and physical activity.

New Move, a girls-only alternative physical education program, was a school-based program (Neumark-Sztainer et al., 2003). It was conducted with girls 14 to 18, but no significant results between intervention and control schools at post-intervention were seen. *Girls on the Move*, also did not result in a significant difference between the intervention and control groups on any physical activity measures despite encouraging feedback from the girls about the program (Robbins et al., 2006). The *Life Skills-oriented Physical Activity Intervention* increased in-class physical activity and reduced high prevalence of school-day television viewing. However, overall daily energy expenditure was not increased (Young, Phillips et al., 2006). Finally, the Physical Activity and Teenage Health (PATH) program was a school-based intervention conducted among multiethnic teenaged girls between 14 to 19 years of age (Bayne-Smith et al., 2004). PATH was taught as a personal wellness course that integrated vigorous exercise, health and nutrition education, and behavior modification. Although there was no significant differences noted in out-of-school physical activity levels, significant differences in body fat, blood pressure, and heart health knowledge was noted (Bayne-Smith et al., 2004).

The Trial of Activity for Adolescent Girls (TAAG) did reveal an increase in physical activity from the intervention school as compared to the control school. These findings supported that a multi-component school- and community-based physical activity intervention can be delivered with good fidelity and result in a middle school environment that supports physical activity for girls. Collaborations with outside agencies doubled in the intervention schools but did not change in the control school. The TAAG intervention represents an evolution from previous work by linking schools with community groups to enhance change (Stevens et al., 2005). The largest intervention (N=2744) was the Lifestyle Education for Activity Program [LEAP], which was a comprehensive school-based intervention that emphasized changes in instruction and school environment. The intervention utilized a Social Ecological Model that emphasized key features of Social Cognitive Theory to increase girls self-efficacy for physical activity (Dishman, Motl et al., 2004). Black adolescent girls composed 48.7 % of the sample size for the LEAP study, which showed significant increases in vigorous physical activity (VPA) among adolescent girls (Pate et al., 2005; Stevens et al., 2005). The TAAG intervention reached out to sources in the community to enhance and strengthen their program (Pate et al., 2007; Pate et al., 2005). School-based programs offer access, convenience, use of current programs, and curriculum and staff assistance. In lean economic times, utilizing current systems makes sense.

However, what happens to physical activity outside of school? Promotion of more physical activity programs beyond the school setting is needed to significantly increase

physical activity levels. More community approaches should be considered to enhance physical activity of black adolescent girls. *Go Girls!*, a community based intervention that targeted low-income, overweight black adolescents to improve physical activity patterns, and improve diet (Resnicow et al., 2000). Activities of this program were designed to enhance skills, efficacy, and outcome expectations. The results of this program showed social support from family and friends were statistically significant for increasing physical activity levels (Resnicow et al., 2000). Community-based programs that address physical activity from a multilevel approach may be more successful for increasing physical activity among black adolescent girls and the community as a whole (Stevens et al., 2005; Young et al., 2007).

Another study that has shown some significant results, and may offer a promising model for health behavior intervention, is the Girls Health Enrichment Multisite Studies [GEMS] (Rochon et al., 2003; Story et al., 2003). These studies were not included in the review of the previous seven studies because the girls in the GEMS were age 10 or younger. However, it is the first multicenter study aimed at black girls. GEMS were conducted as four interdependent, randomized clinical trials. The purpose of the studies was to test interventions designed to prevent excess weight gain by black girls focusing on pre-adolescent ages 8 to 10 (Baranowski et al., 2003; Rochon et al., 2003; Story et al., 2003). Each center developed its own intervention and corresponding control group, and tailored its study on their selected sample and hypothesis being tested (Rochon et al., 2003). Although statistical significance was not noted, physical activity measures were greater in the intervention groups compared to the control groups (Baranowski et al.,

2003) . Thus, the researchers concluded that community-based afterschool intervention programs targeted toward black girls at high risk for obesity are well received, and offered a promising model for future health behavior interventions.

Other models that may be effective in increasing physical activity are church based programs. The Health-e-AME Faith-Based Physical Activity Initiative showed that church-based programs were effective in addressing health needs of church members (Baruth, Wilcox, Laken, Bopp, & Saunders, 2008; Bopp, Wilcox, Laken, & McClorin, 2009; Wilcox et al., 2007). A random telephone survey of 20 churches in South Carolina of African Methodist Episcopal Churches revealed that 42% of respondents had a physical activity program within their church (Bopp et al., 2009). Walking and aerobics programs were the type of programs most often reported. The church environment emphasizes the importance of families, and offers an opportunity for parents and children to participate in activities together. This study found that church-based physical activity programs and social support within churches were associated with greater participation in regular physical activity by church members (Bopp et al., 2009). Although most of the studies conducted in black churches have focused on adults (ages 18 years or older), these studies emphasize the significance of the church in addressing some of the health issues within the black community (Barry, Sutherland, & Harris, 2006; Bopp et al., 2009; Kreuter, Lukwago, Bucholtz, Clark, & Sanders-Thompson, 2003; Peterson, Yates, Atwood, & Hertzog, 2005; Whitt-Glover, Hogan, Lang, & Heil, 2008; Wilcox et al., 2007). However, more health behavior programs that focus on black youth should be implemented and evaluated.

The Go Girls study was an intervention study that was aimed at black adolescent girls conducted in middle and upper income black churches (Resnicow, Taylor, Baskin, & McCarty, 2005). The study was well received within the church and participants who attended more than three-quarters of the sessions had significantly lower BMI and percentage of body fat compared to those who attended fewer sessions (Resnicow et al., 2005). Black churches are gaining recognition as a viable source to address some of the health issues facing the black community (Barry et al., 2006; Isaac, Rowland, & Blackwell, 2007). In addition to increasing the number of physical activity programs directed at black adolescent girls, the programs designed and implemented need to be culturally tailored for black adolescent girls.

Culturally Relevant

Culture considerations of black participants are essential in developing programs that are culturally sensitive and that will meet the needs of the study participants. Cultural sensitivity is defined as “the extent to which ethnic/cultural characteristics, experiences, norms, values, behavioral patterns and beliefs of a target population as well as relevant historical, environmental, and social forces are incorporated in the design, delivery, and evaluation of targeted health promotion interventions” (Resnicow, Braithwaite, Dilorio, & Glanz, 2002, p. 493). Studies that have been culturally tailored have shown that interventions are more effective when they are specifically designed for the populations they serve (Belgrave, Chase-Vaughn, Gray, Addison, & Cherry, 2000; Belgrave et al., 2004; Corneille, Ashcraft, & Belgrave, 2005; Dowda et al., 2004; Gans et al., 2003;

Kreuter et al., 2003; Kumpfer, Alvarado, Smith, & Bellamy, 2002; Pittman, 2003).

Resnicow et al. (2002) discussed the importance of incorporating cultural components into programs targeted at culturally diverse groups to ensure effectiveness.

Afrocentrism is a wide range of ideas, beliefs, and practices associated with African American or black culture (Corneille et al., 2005; Gilbert, Harvey, & Belgrave, 2009; Pittman, 2003; Schiele, 1990). For the purpose of this study, the Afrocentrism practices or beliefs that will be considered are spirituality, expressive communication and, interconnectedness (commonality). Expressive communication refers to poetry, art, music and dance that are unique to black culture. The rap music and jazz that has its origin in the black community. These are just a few examples of expressive communication. Interconnectedness or commonality is sharing the similar experiences and beliefs. One commonality that is unique for black girls and women is hair care and maintenance. It is the comfort of doing that others (black women) like yourself know what you are going through. In designing the intervention, these components will be incorporated into the intervention to make it more appealing and culturally relevant to black adolescent girls. The infusion of these components will be discussed under the intervention section.

Spirituality is very important in the black community. Resnicow et al. (2002) noted that black adolescents placed higher value on religion than white adolescents. Therefore, black adolescents may be more receptive to a program associated with the church. The intervention planned for this study was church-based, which is a step toward addressing the component of spirituality.

Church-Based

Throughout history black churches have served various roles in the community and are viewed as the epicenter in many communities (Aaron, Levine, & Burstin, 2003). Utilizing the church in the black community as a means of providing education and access to physical activity could prove to be an effective intervention. Health promoting programs in black churches have proven to be very beneficial and effective in meeting the needs of the black community and reducing health disparities (Bopp, Wilcox et al., 2007; Isaac et al., 2007; McNabb, Quinn, Kerver, Cook, & Karrison, 1997; Peterson et al., 2005). Health care organizations may want to form a partnership with churches to develop and build health promoting programs within the structure of the church (Hatch & Voorhorst, 1992). Churches can play an important role in health promotion efforts among blacks because of their central role in spiritual guidance, communication, social support, and networking (Hatch & Voorhorst, 1992; Whitt-Glover et al., 2008). Social pressure from church members and church leaders may help influence participation in physical activity programs.

Goal Setting

In addition to effective physical activity programs, relevant strategies that help promote on-going physical activity are just as essential. To succeed or accomplish a task, adolescents develop diverse self-regulatory skills, such as goal setting, time management, and self-evaluation (Zimmerman & Cleary, 2006). It is believed that self-efficacy and self-regulation are reciprocal to one another, in that individuals with a high confidence

level are more likely to set more challenging goals. Studies support that self-regulation strategies have a positive impact on youth attaining set goals (Shimon & Petlichkoff, 2009; Wills, Isasi, Mendoza, & Ainette, 2007). Therefore, goal setting will be a key strategy implemented in this study.

Goal setting is a self-regulation strategy that will be utilized in this study. Goal setting as previously defined, involves establishing realistic and attainable outcomes for performing a target behavior (Zimmerman & Cleary, 2006). Setting goals help improve intention to engage in physical activity. It has been identified in the literature as an effective strategy for behavior change, by influencing behavior through the mobilization, direction and persistence of effort (Kyllo & Landers, 1995; Locke & Latham, 2002). When setting goals an individual must decided on specific outcomes of performance, set standards of proficiency and specify a time frame for completion (Locke & Latham, 2002), thereby, establishing intention. Goals affect performance through four mechanisms: directive function, motivating function, persistence, and strategy development (Locke & Latham, 2002). First, goals as a directive function help guide the achievement of the task or performance. Second, setting goals helps motivate an individual to complete the task. Third, when goals are established, individuals will work diligently to reach the outcome. As goal difficulty increases, so does the required effort to reach the goal (Shilts, Horowitz, & Townsend, 2004a). Fourth, goals affect action and lead to strategy development. By setting goals individuals are compelled to develop strategies to foster accomplishment of the goals (Locke & Latham, 2002; Shilts et al., 2004a). Various factors may contribute to individuals not adhering to a physical activity

program. However, higher adherence to a physical activity program is associated with goal setting (Kyllo & Landers, 1995; Nies & Kershaw, 2002).

Goal setting has the potential to be an important facilitator of behavior change, such as setting goals that promote physical activity. Research studies have shown that goal setting is an effective strategy to change or influence behavior (Dishman et al., 2006; Kyllo & Landers, 1995; Locke & Latham, 2002; Shilts et al., 2004a). A meta-analysis of 36 studies by Kyllo and Landers (1995) showed that goal setting increased exercise performance and was predictive of physical activity. Goal setting as a strategy in physical activity interventions aimed at adolescents has been used in a few studies with good success (Dishman et al., 2006; Horowitz, Shilts, & Townsend, 2004; Patrick et al., 2006; Shilts, Horowitz, & Townsend, 2004b; Young, Phillips et al., 2006). Young et al. (2006) used goal setting as one of the specific strategies for their intervention study. Although no significant changes were noted in daily energy expenditures, improved cardiorespiratory fitness ($p < .001$) was observed (Young, Phillips et al., 2006). Goal setting was a key strategy in the EatFit intervention where students set physical activity goals using the results from their self-assessment. Improved physical activity behavior was noted using this strategy (Horowitz et al., 2004).

Be SMART when setting goals. Goals should be specific, measurable, attainable, relevant and time-specific (Kyllo & Landers, 1995; Locke & Latham, 2002). Feedback enhances goal achievement and should be provided regularly. The concept of self-efficacy and intention are important in goal-setting, which are determinants for physical activity (Dishman et al., 2006; Locke & Latham, 2002). Individuals with high self-

efficacy set higher goals than individuals with lower self-efficacy, therefore, goal setting enhances self-efficacy and intention to change a behavior (Dishman et al., 2006).

Summary

Gaps in the literature were clearly evident and the need for more physical activity interventions tailored for black adolescent girls was warranted. The Theory of Reasoned Action was the theory used to understand the influence of attitude on intention to be physically active. Statistics show that physical activity levels decline in all adolescents, but there is a significantly higher decline among black adolescent girls (CDC, 2010). Studies to help explain and explore this difference should be conducted.

Attitude toward physical activity has been identified as an important predictor for engaging in physical activity among black adolescent girls. Could attitude be the key determinant of why physical inactivity is higher among black adolescent girls? Studies are needed to consider this possibility, as well as explore other reasons among this population. Because of the physical inactivity noted among black adolescent girls, mortality and morbidity associated with obesity, cardiovascular disease and diabetes are significantly higher in black women. Efforts to address or improve physical activity among black adolescent girls are few, and have mostly occurred in school settings. Consequently, of the seven intervention studies reviewed, only two were conducted with an all black population. Thus, emphasizing the need for culturally tailored physical activity interventions among black adolescent girls. Studies are required to determine what are the most effective programs in this population and why.

CHAPTER III

METHODOLOGY

Design

A *one-group* pre- and post-test design was used to test a 12-week feasibility study of a church-based physical activity program for black adolescent girls aimed at changing attitudes toward physical activity that would result in increased physical activity.

Hypothesis: Participation in the program would increase positive attitudes towards physical activity and greater intentions to engage in physical activity among black adolescent girls, resulting in:

1. Higher attitude scores from pre- to post- intervention.
2. Improved self-efficacy from pre- to post- intervention.
3. Increased enjoyment of physical activity from pre- to post- intervention.
4. Increased intention from pre- to post- intervention.

The secondary goal was to examine the extent to which participation in the program increases black adolescent girls' participation in physical activity and physical fitness.

Hypothesis: Participation in this program would increase physical activity levels and physical fitness among black adolescent girls and there would be:

5. An improvement in physical activity levels of black adolescent from pre- to post-intervention.

- a. An increase in the level of daily physical activity assessed by number of steps walked per day as measured by the pedometer from week 2 to week 8 of the intervention.
 - b. An increase in fitness (VO₂ max) as estimated by the Polar heart monitor across 3-time points: pre-, midpoint and post-intervention (1, 6 and 12 weeks) in black adolescent girls participating in the study.
6. There would be a decrease in body mass index (BMI) across 3-time points: pre-, midpoint and post-intervention (1, 6 and 12 weeks) in black adolescent girls participating in the study.
7. Perceived expectations of others and social support would positively correlate with physical activity levels among black adolescent girls.

Setting

The study was conducted in the City of Durham which is the county seat of Durham County. Durham is the fifth largest city in the state of North Carolina with a population of 209,009; blacks in the city of Durham consisted of 43.8% of the population (U.S Census Bureau, 2009). The study was conducted in two of the largest predominately black churches in Durham. Church number 1 was located in the East End Community of Durham, and church number 2 was located in the West End Community of Durham. Both had a large congregation of over 1,000 members and were very visible in the black communities they served.

Sample

A convenience sample of black adolescent girls between the ages of 12-18 from two churches and local communities, who met the criteria for inclusion, was recruited. Inclusion criteria were girls who self-identified as black or African American, were between the ages of 12-18 years, and were able to read and speak English. Exclusion criteria were medically diagnosed as disabled, having a medical condition that prevented one from engaging in regular physical activity (such as sickle cell flare, cerebral palsy, multiple sclerosis, spina bifida, recent surgery within the past 3 months, casted or broken limb) and a medical diagnosis of asthma, brittle diabetes, or arthritis. Pregnant teens from either medical diagnosed or self-awareness was excluded. Inclusion and exclusion criteria are depicted in table 4.

Table 4. Inclusion and Exclusion Criteria with Rationale

Inclusion Criteria	Rationale
Self reported as 12 – 18 years of age	Physical inactivity is significantly higher in adolescent girls (Felton, G., Dowda, M. et al., 2002; Kimm, S. Y. S. et al., 2002; LaFontaine, T., 2008).
Self-described as black or African American	Studies show that black girls have a higher incidence of physical inactivity (Kimm, S. Y. S. et al., 2002; Ries, A. V. et al., 2008).
Girls only	Studies show that girls are more likely to be inactive than boys in the same age group (Kimm, S. Y. S. et al., 2002; Neumark-Sztainer, D., Story, M., Hannan, P. J., Tharp, T., & Rex, J., 2003; Ogden, C. L., Flegal, K. M., Carroll, M. D., & Johnson, C. L., 2002; Ries, A. V. et al., 2008). Boys were identified by girls as a barrier to physical activity; in addition, boys would viewed as more athletic and more likely to participate on sport teams or other organized activities (Vu, M. et al., 2006).
Must pass the PAR-Q	To reduced health risks or injuries to participants.
English Speaking	To ensure comprehension and understanding of verbal and written tools and instructions.
Exclusion Criteria	Rationale
Medically diagnosed Physical or mental disability	To create a sample that is more homogeneous, and to ensure that all participants can function or perform activities at or close to the same level.
Having a medical condition that prevents one from engaging in regular physical activity, especially asthma, diabetes, MS, arthritis and pregnancy. (Answered <i>Yes</i> to any of the questions on the PAR-Q)	To ensure safety of all participants, and to prevent injury.

Human Subjects Protection

Approval for the use of human subjects was granted from The Institutional Review Board (IRB) at the University of North Carolina at Greensboro. A letter of support was obtained from the two churches participating in the study. All University policies were followed in conducting this research study. Participants in this study were minors (less than 18 years of age) therefore consent was obtained from a parent and/or legal guardian along with the assent of the minor female (see Appendix A).

All persons involved in 1) recruiting and enrolling subjects, and 2) collecting, reviewing, or analyzing data completed a human subjects' protection certification training. The PI ensured that all members (3 nurses, 1 health educator and 1 aerobics instructors) of the research team were trained for the study protocol and procedure.

Participants were informed that participation in the program was voluntary and they could withdraw at any point and time during the program without any consequences. For all interested parties that met the required inclusion criteria, consent was obtained from a parent and/or legal guardian and assent from the adolescent girl prior to the end of the information session. Parents were not allowed to review the girls' data once it was provided to the research team members, and parents were informed of this prior to being asked to consent to the study.

Recruitment

Participants were recruited through church announcements and bulletins. The Youth Minister from church #1 assisted with the recruitment effort at this church and

served as the liaison between the principle investigator (PI) and other church leaders. At church #2, the Parish Nurse assisted with recruitment and served as the liaison between the principle investigator and other church leaders. Youth organizations (choirs, youth groups, teen summits, afterschool programs) within the churches were targeted. In the West End Community of Durham fliers were posted in the local community center to recruit girls from the surrounding community. The recruitment process went well, with large numbers showing up at both churches for the information sessions.

Two information sessions were held to provide information to all interested participants at 2 weeks prior to the start of the 12-week intervention program. Parents/guardians and daughters attended one of these sessions. The purpose of the information sessions was to provide an overview of the program, answer any questions, and obtain consent/assent of participants. A *Physical Activity Readiness Questionnaire* (PAR-Q) was completed during the information session to identify the small number of individuals for whom physical activity might have been inappropriate or those who needed medical advice concerning the type of activity most suitable for them. Oral consent and assent was obtained of mothers and daughters prior to administration of the PAR-Q. The PAR-Q was a pre-screening tool. No information obtained from the PAR-Q was recorded or used for data collection and that data was shredded immediately after the information session.

The health history profile and demographic sheets were given to parents/guardians during the information session after the consent and assent had been obtained. Parents and participants were instructed to complete all questions and return

history profile and demographic sheets to the PI before leaving the information session. This allowed the primary investigator (PI) adequate time to review all health history profiles to assure eligibility and safety risk. All health history profiles were thoroughly reviewed by the PI, who is a licensed and registered nurse with over 25 years of clinical experience. Any potential participants not meeting study criteria were not allowed to participate in the study. Each participant that met all eligibility criteria and had consent and assent to participate in the study was given an appointment to return the following week to complete the data collection process.

Strategies to minimize attrition included having the same PI collect data from each participant over all time points to foster trust and rapport. The participants' provider their cell phone number and e-mail addresses during the original information sessions, therefore, reminder messages were sent out to all participants prior to each sessions as well as words of encouragement and general information about the sessions. Incentives were also provided at various points throughout the project (see Table 5). The intervention had minimal attrition for the 12 week process.

Table 5. Incentives for participants. All participants received the following:

<u>Session</u>	<u>Incentive</u>
Week 1	\$ 20.00 Northgate Mall gift card
Week 2 to 5	prizes and incentives were awarded for meeting goals, most steps walked per pedometer, and attending required sessions
Week 6	\$ 20.00 Northgate Mall gift card
Week 7 to 11	prizes and incentives will be awarded for meeting goals, most steps walked per pedometer, writing in physical activity journal and attending required sessions
Week 12	\$ 40.00 Northgate Mall gift card - must have attended at least 10 of the sessions to be eligible for the week 12 incentive.
Gas cards	Parents/guardians received \$ 60.00 worth of gas cards that were distributed as follows: \$ 10.00 (week 1), \$25.00 (week 6) and \$ 25.00 (week 12).
Church(es)	\$250.00 stipend for use of the facility to cover electrical cost, cleaning and other expenses.

Total cost of incentives were \$ 140.00 per participant.

Data Collection

Clinical measures and all surveys were completed on a pre-screen day prior to the start of session 1. The estimated time for each participant to complete clinical data was 12 minutes, therefore participants were scheduled in 15-minute blocks to ensure a timely and orderly process for clinical data collection. Clinical data collection involved obtainment of height, weight, blood pressure & fitness levels. The written surveys [Adolescent

Physical Activity Recall Question (APARQ), Physical Activity Enjoyment Scale (PACES), Self-Efficacy, Attitude, Intention, & Social influence] (see Appendix B) were self-administered and completed after the clinical data had been obtained in a classroom with a health educator to provide instruction and offer any assistance as needed. The health educator had a standard script she followed throughout data collection and the same health educator was used on all data collection days. The total time required for all data collection was approximately 40 minutes. The first data collection day was held the week prior to the start of the intervention, thereby, the first intervention day was dedicated to starting the intervention with an overview of the program and the start of the first aerobic class. A second data collection day was at week 6 and with no class session held on that day. Participants were again scheduled in 15-minute blocks starting at 4:00pm to 8:00pm. The third and last data collection day was at week 12 and the process was the same as day one of data collection due to collection for post-surveys. The scheduled appointments worked well and the same appoint time was repeated throughout each data collection point to ensure the participants' data was collected the same time. Participants and parents signed and received the gift card incentive at the end of each data collection point, once all information had been checked and verified by the PI. Incentives were tied to attendance, therefore, missing 2 or more sessions prior to a data collection point made a participant ineligible for that specific incentive.

Clinical Measures / Scales

Survey data were obtained through the following self-report tools: Self-efficacy, Physical Activity Enjoyment Scale (PACES), Attitude scale, Intention scale, Social Influences scale and family support scale (see Table 6). All surveys were completed on day one (pre-survey) of the study to establish baseline. All surveys except for the social influences and family support scale were recollected at the end of the study (post-survey). Social influences and family support surveys were used for baseline data only.

The demographic questionnaire collected contextual and participant's characteristic information regarding age, current grade level, ranking in school, home environment (single or two parent home, number of siblings, house or apartment, annual household income), sport participation, parent's education level, and items regarding neighborhood safety and environment. The health profile elicited information about perceived health status, health history, allergies, current medical regimes, medications, last monthly period (LMP), birth control method, and any physical or mental condition that was used to assess eligibility for the study.

Table 6. Constructs of Theory of Reasoned Action with Corresponding Measurements

Concept	Variable	Measures	Data Collection
Attitude	Attitude	Attitude scale	Pre-test, Post-test
	Enjoyment	PACES	Pre-test, Post-test
Beliefs	Self-Efficacy	Self-efficacy	Pre-test, Post-test
Intention	Intention	Intention scale	Pre-test, Post-test
Subjective Norms	perceived expectations of others	Family support	Pre-test (baseline)
	Social Support	Social influences	Pre-test (baseline)
Behavior	Physical Activity	APARQ (METs)	Pre-test, Post-test
		Pedometers	Week 2 & 8
		A midpoint weekly log	Midpoint (week 6)
	Health: Blood pressure	B/P	Week 1, 6, & 12
	Fitness	Polar Heart Monitor	Week 1, 6, & 12
	BMI	weight and height per age- and sex-specific	Week 1, 6, & 12

For the purposes of this study, body mass index (BMI) and heart rate were clinical markers of health status. Height was obtained using a stadiometer with the participant standing, facing directly ahead with feet together and shoes off. The subject was asked to inhale deeply while maintaining a natural stance. The movable head of the stadiometer was brought to the highest point of the head with sufficient pressure to compress the head. The measurement was recorded to the nearest 1 millimeter just before exhalation (Lohman, Roche, & Martorell, 1988). Weight was obtained with girl's shoes off (socks only) and wearing light clothing, using a portable electronic scale (Scale-Tronix) with good reliability and validity. Weight was recorded to the nearest .01 in kilograms. These measurements were used to calculate the BMI. For children and teens, BMI was age- and sex-specific and is often referred to as BMI-for-age, and was plotted based on percentile

rankings. The BMI for a teen was calculated from a person's sex, age, weight and height. The BMI Percentile Calculator for Child and Teen (CDC, 2009b) was used to calculate BMIs. Weight and recalculation of BMI's were obtained at 3 points during the study, beginning, midpoint and end of study (1, 6 & 12th week). Precautions were taken for participants' safety and include checking shoes to ensure good fit and nonskid soles, standing beside the participant, and removing any non-secured throw rugs from the floor where the measurements took place.

Blood Pressure

Normal BP in adolescence was defined as systolic blood pressure (SBP) and diastolic blood pressure (DBP) that was less than the 90th percentile for sex, age, and height (USDHHS, 2005). Blood Pressure was dichotomized as normal or elevated as per national standards (AHA, 2009; USDHHS, 2005). Blood Pressure (BP) was measured with a standard clinical sphygmomanometer, using a stethoscope placed over the brachial artery pulse, proximal and medial to the cubital fossa, and below the bottom edge of the cuff (USDHHS, 2005, p.5). Cuffs were available in three sizes (child, small adult, and standard adult) to assure accurate and appropriate readings. At each designated time point, two measurements were taken and the highest score of the two measures was recorded.

Fitness / Polar Heart Monitor

The *gold standard* measure of cardiorespiratory fitness were *maximal aerobic power or VO₂ max*, the maximal rate at which a person is able to consume oxygen during exhaustive exercise (Ward, Saunders, & Pate, 2007). However, for the purpose of this study an estimation of VO₂ max was obtained with the Polar S810i Heart Rate Monitor (PHM), which estimated cardiovascular fitness based on one's heart rate variability (Nunan et al., 2009; Polar Fitness Test, 2009). The PHM gave a reading or individual OwnIndex that was an estimation of to VO₂ max, a commonly used descriptor of aerobic fitness (Polar, 2006). Because the OwnIndex (national norms) has been validated only in healthy adults between 20 to 65 years of age, the PHM readings were used to assess distribution of fitness levels among a group of adolescent. In other words, ranking scores, not absolute estimated values, were used. The PHM readings were obtained at 3 points during the study: the beginning, midpoint and at the end of the study (1, 6, and 12 weeks). A small wireless transmitter was placed around the upper chest and a wristwatch like device was used to record the fitness level. The total procedure time took about 12 minutes. The participants were asked to lie quietly with no talking during the test (Polar Fitness Test, 2009). Each person's gender, age, height and weight were entered into the PHM prior to starting the test. The purpose of using this device was to monitor changes in cardiovascular fitness and to track progress. It takes a minimum of 6 weeks on average to note changes in cardiovascular fitness and may serve as a good motivational tool (Polar Fitness Test, 2009; Ward et al., 2007). The correlation coefficient between the laboratory measures and prediction values was 0.97 and the mean error in VO₂ max was

6.5% (Polar Fitness Test, 2009). Two readings were obtained and an average of the two readings was used as the baseline for fitness (VO₂ max).

Physical Activity

Levels of physical activity were assessed according to the definition of MPA and VPA using two methods: Self-report (logs and surveys) and pedometers. Physical activity records/logs are valid to measure physical activity levels (Garcia, George, Coviak, Antonakos, & Pender, 1997; LaMonte, Ainsworth, & Reis, 2006). Self-report continues to be the most popular measurement for physical activity and has shown adequate reliability, content validity, and relative criterion validity in youth (Bauman, Phongsavan, Schoeppe, & Owen, 2006; Sallis & Saelens, 2000). The self-report tool that was used to assess physical activity levels were the *Adolescent Physical Activity Recall Questionnaire (APARQ)* (Booth, Okely, Chey, & Bauman, 2002). A modified version of the APARQ was used in this study, which listed a number of common physical activities with a column to record frequency and duration. The APARQ showed good reliability and acceptable validity. For the three-category measure (vigorous, adequate and active), percent agreement ranged 67% - 83% and weighted kappa ranged 0.33 – 0.71 (Booth et al., 2002). The girls were instructed to select the activity in which they had participated in during the last 30 days and indicate the frequency and duration of each activity.. The responses were then converted into metabolic equivalent (METs) by use of the Compendium of Physical Activities (Ainsworth, et al., 1993; 2000; Booth, Okely, Chey, & Bauman, 2002). The Compendium of Physical Activities helped to facilitate coding of

physical activity and promoted comparability of coding across studies (Ainsworth et al., 1993; Ainsworth et al., 2000). All activities were assigned an intensity unit based on their rate of energy expenditure expressed as METs.

A metabolic equivalent (METs) was a unit used to estimate the metabolic cost or oxygen consumption of physical activity (Ainsworth et al., 1993; Ainsworth et al., 2000). One MET equaled the resting metabolic rate and was defined in practical terms as the energy or oxygen expended as someone sits quietly while reading a book, for example. Less than one MET was complete inactivity, such as reclining while watching television. METs less than 3.0 was categorized as light activity, 3.0 – 6.0 was moderate activity, and greater than 6.0 METs was defined as vigorous activity (Ainsworth et al., 2000; LaMonte et al., 2006). METs were used in this study to quantify energy expenditures of physical activity recorded by participants. It helped to standardize the results which facilitated more consistency, precision and reproducibility in measuring physical activity (LaMonte et al., 2006). The APARQ was completed both pre and post intervention.

In addition to the APARQ, participants were given a physical activity log (PAL) booklet to keep track of their daily physical activity during the course of the study (see Appendix D). The PAL was a personal record used to encourage and motivate participants to be active and to track their individual's goals and accomplishments. However, after a few weeks into the intervention many of the girls had misplaced their PAL booklet or would forget to bring it to class. The PAL booklet contained a section for recording the date, time and frequency for physical activities performed during the week. Therefore, to obtain this information a physical activity worksheet, similar to the log in

the PAL booklet, was used to assess physical activity levels at week 6 – midpoint (see Appendix C). The girls were instructed to record their physical activity for the week, indicating frequency and duration. This sheet was categorized into *organized sports* and *leisure-time physical activity (non-organized)*. Similar to the APARQ, the information on the 6-week physical activity log was converted into METs by use of the Compendium of Physical Activities.

Pedometers

Pedometers were inexpensive, easy to use, and offered objective measures of accumulated steps that correlated with physical activity, and were used to assess physical activity levels at week 2 and week 8 of the study. Studies have shown pedometers to be a valid assessment of physical activity in adolescents (Hohepa, Schofield, Kolt, Scragg, & Garrett, 2008; Masurier, 2005; Scruggs, 2007). Criterion-related validity involved a comparison, and validating the instrument against some form of external criterion (Rowe & Mahar, 2006). Therefore, Omron HJ-112 Digital Pocket Pedometers were used as the criterion standard for the recordings on the midpoint (week 6) physical activity log sheet. Participants were instructed to wear the pedometer (Omron HJ-112) from the time they woke up (avoiding bathing/showering time) until they went to bed for the night (Masurier, 2005). The pedometer was worn for 7 days to record the number of steps taken within that time period. The girls were instructed to wear the pedometers from Wednesday to Wednesday for church 1 and Thursday to Thursday for church 2, to capture week-end activity. The Omron HJ-112 Digital Pocket Pedometers had the

capacity to store up to 7-days worth of data. Each night at midnight the pedometer self-programmed back to zero, stored previous steps, and allowed participant to start at zero each day. Participants were asked not to tamper or alter settings on the pedometers. Participants wore the pedometers during week 2 after the session on goal-setting and during week 8. A previous study had shown that wearing of pedometer was a good motivator for being active (Felton et al., 2005).

Enjoyment

Exercise enjoyment was assessed using the *Physical Activity Enjoyment Scale (PACES)*. PACES was developed to measure physical activity enjoyment (Kendzierski & DeCarlo, 1991; Motl et al., 2001). The PACES contained 16 items rated on a 5-point Likert scale from 1 = strongly disagree to 5 = strongly agree (Motl et al., 2001). A total score was obtained by summing items, with higher scores indicating more enjoyment, and a lower score indicating less enjoyment. Negatively-keyed items were reversed scored prior to analysis. Cronbach's alpha has ranged from 0.81 to 0.88 (Barr-Anderson et al., 2007; Schneider & Graham, 2009). In a study by Robbins, Pis, Pender, & Kazanis, (2004) the internal consistency of PACES was .90 when used with 12- to 16-year-old children. It has been considered a valid and reliable measure of physical activity enjoyment among adolescent girls (Kendzierski & DeCarlo, 1991; Motl et al., 2001).

Construct validity was determined through factorial validity. Factorial validity of PACES scores in adolescent girls were performed using exploratory factor analysis (EFA) and confirmatory factory analyses (Motl et al., 2001). These analyses were

performed on two samples: calibration and cross-validation. The calibration sample was used to initially estimate the factor structure. A cross-validation sample was used to determine that the instrument is appropriate for different groups than the group used to develop the instrument (Polit, 1996). EFA was performed to examine the relationship among the various items of the PACES. Confirmatory factor analysis (CFA) was used to test the hypothesized relationships among scores from the four measures [of enjoyment, factors influencing enjoyment of physical education, physical activity, and sport involvement] (Motl et al., 2001).

The construct validity of PACES scores was tested using structural equation modeling (SEM) to test the hypothesized relationship among measures of enjoyment, and the independent variables [factors influencing enjoyment of physical education, physical activity, and sport involvement] (Motl et al., 2001). The primary finding provides support for the validity of scores from the PACES as a measure of physical enjoyment among black and white adolescent girls (Motl et al., 2001; Schneider & Graham, 2009). The Cronbach's alpha for this study was acceptable ranging from .81 to .91.

Self-Efficacy

In this study, self-efficacy was measured using a modified version of Saunders' (1997) *Self-Efficacy Scale*. The modified version was an 8-item subscale of self-efficacy directed at assessing one's confidence in their ability to be physically active. The 8-item questionnaire was rated on a 5-point scale ranging from 1= strongly disagree to 5= strongly agree (Motl et al., 2000). A total score was obtained by summing items, with

higher scores indicating a stronger self-efficacy, and a lower score indicating poor self-efficacy.

Confirmatory factor analysis (CFA) was used to test the construct validity and invariance of the self-efficacy scale among adolescent girls (Motl et al., 2000). The final model contained 8-items forming a single factor and it demonstrated acceptable fit (Motl et al., 2000). The 8-item measure of self-efficacy possessed factorial validity and invariance among adolescent girls in the sample.

This modified scale has shown to be valid and reliable with a Cronbach's alpha of .81 (Barr-Anderson et al., 2007; Motl et al., 2000). Test-retest reliability was .57 (Felton, Dowda et al., 2002). Self-efficacy as a strong prediction of physical activity has been established in other studies among adolescents (Beets et al., 2007; Dishman, Motl et al., 2004; Dunton, Schneider, & Cooper, 2007; Dzewaltowski et al., 2007; Pender et al., 2002; Robbins, 2004). The Cronbach's alpha for this study was acceptable ranging from .84 to .85.

Attitude toward Physical Activity

Measuring attitude toward physical activity was obtained using a scale modified by Motl et al. (2000) in a study that was directed at testing the factorial validity and invariance of social cognitive determinants of physical activity. The original attitude questionnaire consisted of 22-items, which was reduced to 8-items forming a single factor. The one factor model was then cross validated. The interfactor correlation from

the final model was 0.55, which demonstrated acceptable temporal stability of the factors across a 1 year period (Motl et al., 2000).

The 8-item questionnaire was rated on a 5-point scale ranging from 1= strongly disagree to 5= strongly agree (Motl et al., 2000). A total score was obtained by summing items, with higher scores indicating a positive attitude, and a lower score indicating a negative attitude. The attitude scale was consistent with the conceptualization of constructs within the theory of reasoned action. The 8-item measure of attitude possessed factorial validity and factorial invariance across groups and time in samples of adolescent girls (Motl et al., 2000). Review of the scale support content validity. The test-retest reliability and the Cronbach alpha was .72 (Felton, Dowda et al., 2002). For the purpose of this study, four additional items were added to reflect key issues identified in the literature. These additional four items were: being physically active takes too much of my time; concerns about my hair keeps me from being more physically active; being physically active is good for my health; and you only need to be physically active if you are trying to lose weight. Therefore, the attitude measurement was a 12-item scale still based on a 5-point scale with the same scoring technique. These four items were added to the original scale to enhance assessment of cultural and adolescent factors related to black adolescent girls. However, the addition of these four items lowered the reliability of the original tool. Therefore, the four added items were removed from the attitude scale to improve the internal reliability of the scale for this study (Cronbach's alpha .77 to .79). The original 8-item tool was used for hypothesis testing.

Intention to Be Physically Active

The intention scale measured a person's intent to be physically active. The intention measurement was a 4-item scale rated on a 5-point scale with anchors of 1 (strongly disagree) and 5 (strongly agree). A total score was obtained by summing items, with higher scores indicating a strong intention to engage in physical activity. Structural Equation Modeling was used to test the construct validity and invariance of the intention scale. The factorial validity and invariance for the intention scale was established based on the results of covariance modeling (Motl et al., 2002). The correlation between intention and expectation was significant, and there were significant correlations among the exogenous latent variables. The R^2 values were .69 for intention (Motl et al., 2002). The invariance of the structural model across race was tested and founded to be acceptably fitted in the samples of black and white girls (Motl et al., 2002). The scale was evaluated by a focus group of eighth-grade girls. In a study by Dishman et al. (2006) the intention measurement in adolescent girls conducted between 9th and 12th grade revealed a Cronbach alpha of 0.91. Confirmatory factor analysis established the structural invariance of the measures across the 3-year study period (Dishman et al., 2006). The Cronbach's alpha for this study was acceptable ranging from .87 to .93.

Subjective Norms

The study by Saunders et al. (1997) used the Social Influences Scale to address *perceived expectations of others* as reflective from the Theory of Reasoned Action. Therefore, the Social Influences Scale was used in this study to assess perceived

expectations of others (subjective norms). The Social Influences scale went through a series of four pilot tests conducted in 5th-grade classrooms with a diverse population, with black children making up 69% of the sample. The pilot test refined and reduced the size of the instrument for better comprehension (Saunders et al., 1997). Validity of the social influences scale was obtained through factor analysis and cross-validation. All factor analyses were conducted using principal components with varimax rotation. The final Social Influences scale contains 8-items based on a 5-point scale ranging from 1= none to 5 = always. All items loaded at least 0.40 on the scale (Saunders et al., 1997). The internal consistency reliability was 0.75 in the development sample and 0.72 in the validation sample. The test-retest correlation coefficient was 0.78 (Saunders et al., 1997). The Social Influences scale has been used in adolescents (10th-graders) with a Cronbach alpha of 0.55 (Reynolds et al., 1990). For the purpose of this study, to obtain more quantifiable responses a 4-point scale was used with the following responses: 1 = none, 2 = 1 to 2 days per week, 3 = 3 to 4 days per week and 4 = 5 or more days per week. A total score was obtained by summing items, with higher scores indicating strong social support and a commitment to assist with being physically active. The Cronbach's alpha for this study was acceptable ranging from .79 to .89.

Social support was measured using *the family support scale*. The family support scale was a 5-item scale rated on 5-point Likert-type scale ranging from 1= strongly disagree to 5= strongly agree. For this purpose of this study a 4-point Likert scale was used instead of a 5-point scale that range from 1 = strongly disagree to 4 = strongly agree. The *neutral* or *in between* response was omitted. Studies among youth indicate that

children and adolescents commonly select neutral or middle responses (Robbins, Wu, Sikorskii, & Morley, 2008). A total score was obtained by summing items, with higher scores indicating strong social support, and a lower score indicating less social support. The Family Support scale has been used in adolescent girls with good validity and reliability (Felton, Dowda et al., 2002). Cronbach's alpha reliability coefficients (.60 to .72.) and stability coefficients (.65 to .76.) were derived from pilot tests of samples of 45 to 75 participants (Felton, Dowda et al., 2002). The Cronbach's alpha for this study was acceptable ranging from .66 to .82.

Program Evaluation

The program evaluation was a 13 item questionnaire developed by the PI based on standard principles to evaluate the effectiveness of the program and to obtain feedback about the program from participants. The questionnaire consisted of 13 items rated on a 5-point Likert scale from 1 = strongly disagree to 5 = strongly agree. The total mean score was 3.64 (SD=.26). The participants were provided space for additional comments.

Intervention Process

The proposed name for this intervention was F.U.N., which was an acronym for **F**itness, **Y**o**U**, **eN**joy (It is all about F.U.N). It was an intervention designed to promote adoption and maintenance of physical activity in black adolescent girls by changing attitudes toward physical activity (see Appendix E). A secondary goal was to improve access to physical activity programs in the black community by using a church-based

approach. To ensure that the intervention was culturally specific for black adolescent girls, infused into the intervention was areocentric components of spirituality, expressive communication and, interconnectedness (commonality). A spiritual theme was taken from Proverbs 22:6 - *Train up a child in the way he should go; and when he is old, he will not depart from it.* This theme highlighted the importance of developing positive attitudes toward health behavior, like physical activity early in a child's development to assure adoption and maintenance of such behavior into adulthood. Using spiritual themes in health messages are an appropriate motivational strategy-for black Americans (Resnicow et al., 2002). As previously stated, the setting for this intervention was church-based. The interconnectedness and commonality was fostered in this intervention because it was directed only at black adolescent girls; the research team members were black as well. Participants were encouraged to sign up with a friend or sister; four sets of sisters were involved with the study.

The goal of the intervention was to: 1) improve attitude toward physical activity, 2) increase participants' overall levels of physical activity, and 3) enhance feelings of enjoyment, physical competence and self-efficacy. Physical competence and self-efficacy toward various physical activities can be enhanced by experimenting with different activities that one may enjoy. Girls were encouraged to keep a *Physical Activity log* of physical activity they engaged in during the week (Bauman et al., 2006; Felton et al., 2005; Sallis & Saelens, 2000).

1. The PAL booklet contained practical tips and general information as well as places for them to write and keep up with their goals and objective each week.

2. A list of fun activities that could be done alone or with family members instead of watching television was included in the PAL. One of the activities was for the girls to formalize their own list of activities that would get them moving and keep them moving. Girls were encouraged to do other physical activities throughout the week in keeping with the requirement of 60 minutes of activity at least 5 days or more per week (USDHHS, 2009).
3. The PAL contained a section for recording the date, time and frequency for physical activities performed during the week.

Another method to increase physical activity competence and enjoyment was to provide and encourage active participation in a 30-minute aerobic dance class. To keep things fun and interesting the girls had input into music selection for the aerobic session (Jazzercise, Gospel hip hop). Dance interventions have been shown to be fun and well received in black adolescent girls and it highlights the social, cultural and historical significance of dance in the African American community (Robinson et al., 2003; Story et al., 2003; Watson, Poczwadowski, & Eisenman, 2000).

The topic for each session was as follows:

Session 1: One step toward changing attitudes toward physical activity is increasing knowledge about physical activity. Therefore, the topic for session 1 focused on defining what is meant by physical activity and what constitutes being physically active. The participants were asked to provide their own definition of physical activity and to list various forms of physical activity. Poster 1 was used at the end of the discussion to summarize key points (see Appendix F for all posters).

The physical activity log (PAL) was distributed to each participant and instructions were provided on the PAL use and purpose. The first dance aerobic class will begin during session 1 and continue with the remaining sessions. The 30-minute dance aerobic segment ended each session. Dance is considered a form of expressive communication and has been identified as an effective and enjoyable form of physical activity for black adolescent girls (Ciccomascolo & Grossi, 2008). In addition, music selection was culturally appropriate.

Session 2: Each session opened with a review of the previous session and a brief discussion of the PAL. Topic 2 was on goal setting (see poster 2 - Appendix F). Goal setting involves establishing realistic and attainable steps for increasing physical activity (Nies & Kershaw, 2002). Studies support that girls who set goals are more likely to form intentions to be physically active (Dishman et al., 2006; Horowitz et al., 2004; Nies & Kershaw, 2002; Patrick et al., 2006; Shilts et al., 2004a; Young, Phillips et al., 2006). Goal setting was a strategy used in this intervention to assist the participants in establishing and setting their individual goals for being physically active. The SMART concept was discussed and examples of how to establish and write measurable goals regarding physical activity were emphasized. The pedometers were distributed during this session and instructions on wear and use were provided. Simple written instruction for the pedometers was sent home with each participant. The pedometers were used as goal setting strategy, i.e., set a goal to walk 10,000 miles each day. All participants were required to write down at least one measureable goal regarding physical activity.

Session 3: The pedometers were re-collected the readings recorded. Exercise bands were given as the prize/incentive for the most steps walked. For church 1 the total most steps walked for week 2 was 50, 848 and for church 2 the total most steps walked was 53,955. Topic for session 3 was on identifying and discussing benefits and barriers to physical activity. Benefits from their view point were (see poster 3 - Appendix E). Participants were encouraged to discuss barriers unique to their environment and suggestions to overcoming such barriers.

Session 4: Topic of discussion was on body image, real versus media depiction (see poster 4 - Appendix E). Cultural differences noted among black adolescent girls regarding physical appearance, and clarifying terms such as fat versus thick. The discussion focused on images and myths of black girls and women. The aim was to alter attitudes toward a healthy lifestyle that involved being more physically active.

Session 5: This session was used to highlight women that the participants' admired or viewed as physically fit. This person may be a sport personality / athlete (see poster 5 - Appendix E) or someone that they wish to emulate in their community that is physically fit. Although the focus for physical activity for the most part is usually geared toward athletes, the point was to emphasize that one does not have to be an athlete to be physically fit. (Alter the belief of what is physically fit or active).

Session 6: This session was dedicated to data collection. No sessions or classes were held during this session. Scheduled appointments were made for each participant to recollect weights and fitness levels (PHM). Participants were scheduled in 15 minute

blocks. The physical activity log sheet for the midpoint assessment of physical activity was collected at this time as well.

Session 7: The topic for this session was on family and social support. What if any social support is needed to engage in or maintain physical activity? The influence of friends, peers, and family on being physically active was discussed. The pedometers were redistributed and the same instructions were provided.

Session 8: An issue or commonality for black girls and women regarding participation in physical activity is hair maintenance. Black hair care and why this is such an issue or problem was discussed. What was the significance of India Arie's song "I Am Not My Hair." We listened to the lyrics and discussed the meaning. Provided copies of *Hair Care Tips for Sisters on the Move*, developed by the Sisters Together program (Dietz, 2001) [see Appendix F].

Session 9: The pedometers were recollected and the results recorded. A pedometer was given as the prize/incentive for the most steps walked. For church 1 the total most steps walked for week 8 was 44,220 and for church 2 the total most steps walked was 62,813. Topic for this session focused on an overview of current statistics of black adolescent girls and women regarding health problems. The important role of physical activity in reducing these health risks was emphasized.

Session 10: "Girl Talk" was the focus of this session. Participants were encouraged to discuss the best way to increase physical activity of other black girls. The question was: What is needed in the school system and community for black girls to be more physically active?

Session 11: Review and recap some of the key points from the sessions. Review goals and accomplishments since starting the study. Elicit ideas and suggestion for improving the program. Complete program evaluation.

Session 12: Data collection: Complete post-surveys. Recollect clinical measures

Treatment Fidelity

The PI was responsible for ensuring that all members of the research team (3 nurses, 1 health educator and 1 aerobics instructors) were trained and knowledgeable about their role. A standardized script was used to ensure consistency when describing the study and providing instructions to participants. The script included an introduction in which physical activity was defined and various levels of physical activity explained. Each session of the intervention was described and a schedule of the program distributed to all participants (see Appendix G). Pre-printed posters with key discussion points were used to ensure consistency between churches and sessions (see Appendix E). The physical activity that was used during the intervention was dance aerobic, which was considered a physical activity that would be appealing to multiple age groups. To address the cultural component of interconnectedness (commonality), the primary members of the researcher team (PI, nurses, health educator and aerobics instructors) were black. These team members worked closely with the church liaison to maintain and ensure effective communication. The research team members were assigned to the same group of participants to ensure consistency throughout the study.

Dose

The F.U.N project was an intervention designed to promote adoption and maintenance of physical activity in black adolescent girls by changing attitudes toward physical activity. It was conducted over a 12 week period for 60 minutes each week. The 60 minutes was divided into two 30-minute sessions. The first 30-minute session was used to discuss and dialogue about key topics aimed at influencing attitude and enhancing self-efficacy and enjoyment, which could affect or shape attitude. The second 30-minute session was an interactive dance aerobics class conducted by a certified aerobics instructor. Healthy snacks and water were provided at each session.

Power Analysis

A total of 41 girls were recruited to participate, with a 15% refusal or dropout rate. A sample of $N=30$ participants had at least 80% power at the $\alpha = 0.05$ level of statistical significance with $\lambda = 10.80$ to detect an effect size of 0.60 or greater, given a repeated measures of ANOVA model comparing mean fitness (VO_2 max) and BMI at weeks 1, 6, and 12 of the intervention (H5& H6). A paired t -test was used to measure the improvement in number of steps walked per day as seen from week 2 and week 8 of the intervention (H5a). Comparable effect sizes were observed in intervention studies conducted in adolescent girls by Resnicow et al. (2000) for the *Go Girls* intervention, New Moves by Newmark-Sztainer, Story, Hannan and Rex (2003), Girls on the Move by Robbins et al. (2006) and GoGirlGo! by Ciccomascolo and Grossi (2008).

Similarly, when comparing pre-post intervention mean differences (H1-H4), our sample had at least 80% power at the $\alpha = 0.05$ level of statistical significance with $\lambda = 2.9$ to detect an effect size of 0.53 or greater, given a paired t -test. A medium effect size of 0.53 represents a percent of non-overlap on the order of 33% to 38% and is consistent with the literature for the H1-H5a measures (Dishman et al., 2002; Kuo et al., 2007; Resnicow et al., 2005; Robbins et al., 2006).

Data Analysis

All of the hypotheses were tested using the Statistical Package for Social Sciences (SPSS), version 17.0 (SPSS, Inc, Chicago, IL). Descriptive statistics (frequencies, means, standard deviations, ranges, skewness, and kurtosis) were used to summarize sample characteristics, clinical variables (pedometer steps, BMI & fitness), and responses to the surveys (PACES, self-efficacy, intention, family and social support scales). Physical activity measures included APARQ, a 6-week self-report log sheet and use of pedometers. Self-report physical activity recordings from the logs were validated through steps on pedometers readings from weeks 2 and 8. Frequencies were used to identify the most frequent activity types. The responses on the APARQ were converted to METS for analysis and comparison by using the Compendium of Physical Activities. The converted values were used to calculate the levels of physical activity to determine if participants were meeting or not meeting recommended activity levels. Reliability of the scales was examined using internal consistency (Cronbach's alpha coefficients). Paired t -tests were used to determine improvement in pre- and post-intervention of attitudes, self-

efficacy, enjoyment, intention and physical activity (H1-H5a). To test H5b and H6, a repeated measure of ANOVA adjusting for age was used to determine whether there are a significant difference in fitness and BMI at weeks 1, 6, and 12 of the intervention. For H7, Pearson's correlations were used to examine the relationships between perceived expectations of others and social support in regard to physical activity levels. Logistic regression adjusting for age was used to examine relationships between each study variable and positive change from pre or midpoint intervention to post intervention. Alpha level of significance was set at .05 for all tests.

Missing Data

The person to person data collection strategies help avoided most problems with missing values in our data. Participants that completed each phase of data collection were included in data analysis.

Preliminary Examination of Data

Descriptive statistics (mean, standard deviation, range, skewness and kurtosis) were calculated for all variables. Frequencies were computed on all variables to visually check for missing data or extreme values. Data entry errors were corrected prior to data analysis. Normality was assessed and confirmed by graphic examination through Q-Q plots (in normal distribution point should cluster around a straight line) and the review of the skewness and kurtosis. Variables were considered normally distributed if skewness

and kurtosis values were between -1.0 and +1.0. The Explore procedure was used to identify any outliers through visualization of boxplots. Outliers were identified with the following variables: Pre- and post- social support scores, pre-self efficacy scores, post attitude scores, pre PACES scores and METs scores (midpoint and post). The outliers were first reviewed to ensure accuracy and completeness of data. Log transformation was conducted on all variables identified with outliers in an effort to improve the interpretability. No significant changes were noted from the Log transformation; therefore the original data measures were used for analysis and interpretation. In addition to Log transformation, running the data without the outliers was performed without any significant changes in the final results.

CHAPTER IV

RESULTS

Findings of the feasibility pilot study are reported in this chapter. A description of the study setting and participants are provided followed by analysis for each hypothesis. The primary goal of this study was to test the feasibility of a physical activity program that was culturally tailored and age and gender specific for black adolescent girls aimed at changing their attitudes toward being more physically active. A secondary goal was to examine the extent to which participation in the program increased black adolescent girls' physical fitness and their participation in physical activities.

Characteristics of Sample

Participants were recruited from two predominately black churches in the city of Durham. Forty-one black adolescent girls were originally recruited and completed the pre-screening process, but due to scheduling conflicts two girls never started the intervention. Therefore, the initial sample size for this study was N=39. Twenty-three point seventeen percent of the participants attended all of the sessions and 41% missed only one session (see Table 7), with retention rate of 94% for 12 -weeks of attendance. Attrition was low with only 2 persons lost to follow-up

***Table 7. The Number of Sessions
Participants Attended over 12
Weeks***

Sessions Attended	Frequency (%)
12	9 (23.2%)
11	16 (41.1%)
10	6 (15.4%)
9	4 (10.3%)
7	4 (10.3%)
Total	39 (100%)

The participants in this study were adolescent girls who self-identified as black. The characteristics of the participants are presented in Table 8. The girls ranged in age from 12 to 18 years of age ($M = 14.15$, $SD = 1.62$). The grade levels ranged between 6th to 12th grade ($M = 8.76$, $SD = 1.64$) with 10th graders representing the most participants at 22.0 percent. The family structure for participants in this study consisted of girls from two parent household (61.0%) with most participants' family annual income between 50,000 to 74,999 (46.3%). The majority (56%) of the girls' parents or guardian had educational background of a Bachelors degree or higher.

The initial demographic information revealed that 56.1% of the participants self-reported they were involved in some kind of sport, with 43.9% of the girls indicating they were physically active at least 30 minutes 3 to 4 days per week. However, 17.1% of the girls self-reported no physical activity and were physically activity less than 30 minutes

per day. The physical activity liked best was dance (43.9%) followed by basketball (31.7%) and then walking (26.8%). The top three sports for the girls in this study were basketball (31.7%), track (29.3%) and soccer (26.8%), respectively. Preliminary data regarding weight status placed most of the participants in the “at risk” (26.8%) or “overweight” (34.1) category as defined by the CDC (2009a). Forty-one percent of participants rated their neighborhood as safe. Gang activities and /or guns and dogs were the most frequent reasons girls identified for neighborhoods being unsafe for physical activity. Most of the participants (65.9%) indicated they had access to some form of recreational or park facility for on-going physical activity.

**Table 8. Demographic Characteristics
of Participants (N = 41)**

<i>Variable</i>	<i>Frequency (%)</i>	
<i>Age</i>		
12	6	(14.6%)
13	12	(29.3%)
14	7	(17.1%)
15	7	(17.1%)
16	5	(12.2 %)
17	3	(7.3%)
18	1	(2.4%)
<i>Grade of Education</i>		
6	3	(7.3%)
7	8	(19.5%)
8	8	(19.5 %)
9	7	(17.1%)
10	9	(22.0%)
11	4	(9.8 %)
12	2	(4.9 %)
<i>Parent Educational Background</i>		
	<i>Frequency (%)</i>	
High School Drop-out	2	(4.9%)
Graduated 12 th grade	3	(7.3%)
Some college	8	(19.5%)
Associate Degree	5	(12.2 %)
Bachelors Degree	16	(39.0%)
Master's Degree	6	(14.6%)
PhD Degree	1	(2.4 %)
<i>Annual Family Income</i>		
Less than 14,999/year	4	(9.8%)
15,000 - 24,999	2	(4.9%)
25,000 - 34,999	3	(7.3%)
35,000 - 49,999	3	(7.3%)
50,000 - 74,999	19	(46.3%)
75,000 – 99,999	4	(9.8 %)
> 100,000	6	(14.6 %)
<i>Family Structure</i>		
Two parent household	25	(61.0%)
Single parent household	15	(36.6%)
Other	1	(2.4 %)

A descriptive summary of key variables in this study is provided in Table 9.

Higher scores on all scales were indicative of a positive trends or improvement.

Reductions in BMIs for at risk or overweight participants were considered a positive change or a desired result for this study.

Table 9. Summary of Study Variables

Variables	Pre (N = 41)		Midpoint (N=39)		Post (N = 37)	
	Mean	SD	Mean	SD	Mean	SD
Fitness	36.79	6.43	36.82	6.38	36.78	6.10
BMI	26.09	6.122	26.46	6.17	26.54	6.30
METs	51.39	37.71	51.54	40.40	40.45	29.53
Attitude Scale	32.15	4.10	-	-	32.14	3.78
PACES (Enjoyment Scale)	63.93	9.42	-	-	64.46	6.75
Self-Efficacy Scale	29.29	5.64	-	-	28.86	4.69
Intention Scale	14.73	3.48	-	-	14.89	2.40
Family Support Scale	9.07	3.82	-	-	9.14	3.03
Social Support Scale	22.71	4.17	-	-	22.59	4.62

Hypotheses Testing

Three hypotheses were tested to evaluate the intervention.

Hypothesis 1: Participation in the program would increase positive attitudes towards physical activity and greater intentions to engage in physical activity among black adolescent girls, resulting in:

- Higher attitude scores from pre- to post- intervention.
- Improved self-efficacy from pre- to post- intervention.
- Increased enjoyment (PACES) of physical activity from pre- to post- intervention.
- Increased intention from pre- to post- intervention.

Paired *t*-tests were used to determine improvement in pre- and post-intervention of attitudes, self-efficacy, enjoyment (PACES), and intention. The findings revealed no significant changes in pre- and post- intervention pertaining to these variables ($p > .05$) [see Table 10].

Table 10. Paired *t*-Test of Variables Pre- (week 1) and Post- Intervention (Week 12)

<i>Variables</i>	Pre		Post		95% CI				
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>T</i>	<i>df</i>	<i>p</i>	<i>Lower</i>	<i>Upper</i>
Attitude	32.38	4.07	32.14	3.78	.459	36	.649	-.832583	1.32
Self-Efficacy	29.19	5.81	28.86	4.69	.367	36	.715	-1.466	2.11
Enjoyment (PACES)	64.68	9.43	64.46	6.75	.211	36	.834	-1.866	2.30
Intention	14.76	3.62	14.89	2.40	-.223	35	.825	-1.3656	1.10

* $p < 0.05$

Additional analyses were performed to explore trends in changes by recoding the differences between pre and post scores for attitudes, self-efficacy, enjoyment, and intention into dichotomized variables reflecting change. A total score with a positive change, increase in value from pre-intervention to post-intervention was dichotomized into “change (1)” versus “no change (0).” Univariate logistic regression adjusting for age was used to explore a relationship between study variables and changes from baseline to post intervention. No significant outcome changes were found for this hypothesis. Trends indicated directions as expected. Odds ratios showed that participants who had a high baseline score on individual variables of attitudes, self-efficacy and intention were more likely to have a positive change from pre-intervention to post-intervention than persons with low baseline scores. Person with high enjoyment scores at baseline were likely to have less change post-intervention. In fact, all enjoyment scores were lower at post intervention (see Table 11).

Table 11. Odds Ratios and Confidence Intervals of Baseline Change vs. No Change at Pre and Post Intervention

<i>Variables</i>	<i>Odds Ratio</i>	<i>P</i>	<i>95% CI</i>	
			<i>Lower</i>	<i>Upper</i>
Attitude	1.202	.072	.984	1.470
Self-Efficacy	1.147	.090	.979	1.344
Enjoyment (PACES)	.959	.414	.867	1.060
Intention	1.085	.564	1.433	.564

*p < 0.05, **p < 0.01.

The secondary goal was to examine the extent to which participation in the program increased black adolescent girls' participation in physical activity and physical fitness levels.

Hypothesis 2: Participation in this program would increase physical activity and physical fitness levels among black adolescent girls.

- There would be an improvement in physical activity and fitness levels of black adolescent girls from pre- to post-intervention.
- There would be an increase in fitness as estimated by the Polar heart monitor across *3-time points*: pre-, midpoint and post-intervention (1, 6 and 12 weeks) in black adolescent girls participating in the study.
- There would be a decrease in body mass index (BMI) across *3-time points*: pre-, midpoint, and post- intervention.

Repeated measures of ANOVAs (analysis of variance) controlling for age were used to determine whether there were a significant differences in Fitness, METs and BMI at weeks 1, 6, and 12 of the intervention when controlling for age. Repeated measures of ANOVA results revealed fitness was significantly different after intervention with or without age as a covariate. METs were significantly different without age as a covariate. BMI was not significantly different without age as a covariate and age significantly influenced the BMI. However, the outcome of these variables was in the unexpected direction (see Table 12).

Table 12. Repeated measures of ANOVA for Fitness, METs & BMI at 3-Time Points: Weeks 1, 6, & 12 adjusting for Age.

Variables	Pre-		Midpoint		Post -					
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>p</i>
Fitness	36.92	6.64	36.78	6.55	36.78	6.10	1	5230.705	56.246	.000**
Age							1	912.347	9.810	.003**
METS	52.41	38.75	50.84	40.70	40.45	29.53	1	16384.291	7.417	.010**
Age							1	5363.466	2.428	.128
BMI	26.25	6.36	26.40	6.34	26.54	6.30	1	37.688	.444	.510
Age							1	1345.008	15.835	.000**

*p < 0.05, **p < 0.01.

- There would be an increase in the level of daily physical activity assessed by number of steps walked per day as measured by the pedometer from week 2 to week 8 of the intervention.

Paired *t*-tests were used to explore changes in pedometer mean readings from week 2 to week 8. The findings of the pedometer readings revealed no significant change from week 2 to week 8 in the mean number of steps walked for each week. In fact, the mean average of steps walked decreased from week 2 (means = 4245) to week 8 (means = 4044) instead of increasing (see Table 13).

Table 13 Paired *t*-Test of Average Pedometer Readings for Week 2 and Week 8

Variables	Week 2		Week 8		95% CI				
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>	<i>Lower</i>	<i>Upper</i>
Pedometer	4244.78	1998.42	4044.11	1546.84	.476	25	.638	-667.44	1068.77

**p* < 0.05.

Despite the fact there were no significant changes noted regarding increases in weekly physical activity participation among participants, trends indicated improvement in vigorous intensity activities, defined as METs \geq 6, noted across the 3-time points of data collection. Activities labeled as vigorous increased each time from 48.5 % to 51.9% to 58.2%, respectfully (see Table 14). Specific physical activities were categorized by intensity level using the Compendium of Physical Activity by Ainsworth et al. (2000).

Table 14. Intensity Levels Noted Across 3-Time Points: Pre-, Midpoint, & Post

Intensity Level	Pre		Midpoint		Post	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Light (≤ 2.9 METs)	4	3.9%	0	0	3	1.8%
Moderate (3.0 to 5.9 METs)	49	47.6%	50	48.1%	68	40.0%
Vigorous (≥ 6.0)	50	48.5%	54	51.9%	69	58.2%
Total	103	100%	104	100%	140	100%

There were multiple responses to this question; therefore *N* varies.

Additional Analyses

Additional analyses were performed to explore trends in changes by recoding the differences between pre, midpoint and post scores for fitness, METs and BMI into dichotomized variables. Scores of fitness, METs and BMI from pre- to midpoint, and pre to post- intervention were dichotomized into “change (1)” versus “no change (0).” Change being defined as values that increased for fitness and total METs, and decreased for BMI. Univariate logistic regression analyses were used to explore a relationship between study variables and changes from baseline to post intervention. Total METs from pre-intervention to post-intervention changed were significant by .029 ($p < 0.05$), indicating that as the variable total METs increased by 1, participants were 1.04 times more likely to have a positive change from pre-intervention to post-intervention. The odds ratios for fitness & BMI showed positive trends that participants who had a high score on these variables were more likely to have an improvement from pre-intervention to post-intervention, though differences were not statistically significant differences (see Table 15).

Table 15. Odds Ratios and Confidence Intervals of Change vs. No Change between Pre & Midpoint (6th week) and Pre & Post (12th week)

Variables	Odds Ratios	P	95% CI	
			Lower	Upper
BMI				
Pre to 6 weeks	1.027	.648	.915	.648
Pre to 12 weeks	1.020	.739	.908	1.146
Fitness Levels				
Pre to 6 weeks	1.100	.094	.984	1.230
Pre to 12 weeks	1.029	.608	.922	1.149
Total METS				
Pre to 6 weeks	1.021	.059	.999	1.043
Pre to 12 weeks	1.039	.029*	1.004	1.075

*p < 0.05, **p < 0.01.

Using separate variables that coded changes from pre intervention to post intervention as 1 for “change” and 0 for “no change,” selected cases were analyzed to examine characteristics of variables that showed a positive change from pre to post intervention with change being coded to 1. Changes in fitness showed 15 out of 37 girls had increased fitness scores from pre to post intervention. Sixty percent of parents of girls with changes noted in fitness had family annual incomes between 50,000 – 74,999 and many girls parents had educational level at the bachelors’ degree or higher level (45.7%). In fact, except for METs, the variables for BMI, PACES, Attitude, Intention and Self-efficacy showed similar characteristics with higher income levels and higher educational levels being associated with positive changes from baseline to post-intervention (see table 16). No significant pattern was noted with regard to age and grade level.

Table 16. Family Characteristics of Participants with Positive Changes from Pre to Post Intervention

<i>Variables</i>	<i>N=37 # of Cases</i>	<i>Family Annual income 50,000 – 74,999 (%)</i>	<i>Parents Educational Level Bachelor Degree (%)</i>
Fitness	15	60.0%	46.7%
BMI	10	60.0%	30.0%
PACES	19	52.6%	36.8%
Attitude	19	63.2%	31.6%
Intention	20	60.0%	40.0%
Self-efficacy	20	50.0%	45.0%
METS	14	35.7%	28.6%

Hypothesis 3: The final analysis explored the relationship between family and friends on improving physical activity levels of black adolescent girls.

- Perceived expectations of others (family) and social support would be positively correlated with physical activity levels among black adolescent girls.

Pearson’s correlations were used to examine the relationships between perceived expectations of others (family) and social support in regard to physical activity levels. A significant positive correlation (.367) was noted between family support at baseline and midpoint METS scores, showing that family support positively correlated with physical activity (see Table 17).

Table 17. Correlation Coefficients for Relationships Among Family and Social Support and Girls Physical Activity Levels

Variables	1	2	3	4	5	6	7	8
1 Total Family Support (Pre)	-	.489**	.167	.367*	.044	-.002	-.129	.008
2 Total Social Support (Pre)		-	.119	.098	-.260	-.003	-.002	.034
3 Pre METs Scores			-	.616**	.204	.324*	.224	.340*
4 Midpoint METs Scores				-	.181	.343*	.172	.269
5 Post METs Scores					-	.119	.124	.126
6 Fitness Pre Scores						-	.881**	.903**
7 Fitness Midpoint Scores							-	.919**
8 Fitness Post Scores								-

**Correlation significant at the 0.01 level (2-tailed)

*Correlation significant at the 0.05 level (2-tailed)

Program Evaluation

In addition to the hypothesis testing, a program evaluation of the project was conducted on the last day of data collection (week 12). The total mean score was 3.64 (SD=.26). The item minimum to maximum was 3.15 to 4.23 respectfully (see Table 18). An item mean score above 3.0 was considered favorable. The girls indicated that the educational sessions, the location and the dance aerobic classes were the most favorable aspects of the program. Descriptive analyses of written comments were positive, with most girls indicating pleasure and satisfaction with the F.U.N program. Some of the documented comments by the participants in the study were as follows:

We really need more programs like this for girls in my community. It was a great experience and I had tons of Fun.

I really enjoyed the sessions, this has motivated me to stay active.
Although I am done with playing a team sport, this information will help
me when I go off to college in the fall!

This was fun, I really enjoyed myself.

Thank you for helping me lose weight.

I enjoyed the sessions ...I wish we could have talked more about health.

There were several comments that indicated the need for continuation of the program.

Some of the girls did not use the *Physical Activity Log (PAL)* booklet as instructed,
perceiving it to be too time consuming; only 47.2% of the girls indicated they would
continue to use their PAL booklet after the program ended. A ninety-five percent
retention rate was achieved through incentive and culturally appropriate strategies.

Table 18. Program Evaluation Responses

	Strongly Agree / Agree	Undecided	Disagree / Strongly Disagree
The objectives for this program were met.	91.7	8.3	-
My expectations for the program were met.	83.3	13.9	2.8
I will continue to use my physical activity log	47.2	44.4	8.3
The educational sessions for this program were helpful and informative.	100	-	-
Physical Activity programs are needed in my community.	77.8	19.4	2.8
Having a physical activity program in the church increased my physical activity level.	77.7	16.7	5.6
I have no desire to continue with a physical activity program after this ends.	2.8	16.7	80.5
I would recommend this program to friends and family.	91.7	-	8.3
This program did not meet my expectations.	-	5.6	94.4
I feel the program was effective in helping me to set goal to increase my level of physical activity	86.1	11.1	2.8
The dance aerobic classes were fun.	97.3	2.8	-
The church is a good location for this type of activity	83.4	16.7	-
I do not think the church is a good place to do physical activity.	2.8	13.9	83.3

Summary

Forty-one black adolescent girls were initially recruited for the intervention, and 39 girls started the intervention. A high retention rate was achieved, with only 2 girls not completing the post data collection process at week 12. The results of the self-report tools: Self-efficacy, Physical Activity Enjoyment Scale (PACES), Attitude scale, and Intention scale revealed no significant changes in scores ($p > .05$). However, trends toward increased physical activity were found.

A relationship between baseline family support and physical activity were found with the midpoint METS. Although data did not show statistical significance post intervention, frequency analyses indicated an increase in vigorous intensity activities, defined as $\text{METS} \geq 6$, across the 3-time points of data collection (1, 6 & 12 weeks), and odds ratios showed high baseline scores associated with positive change post intervention.

CHAPTER V

DISCUSSION

The primary purpose of this study was to test the feasibility of a physical activity program that was culturally tailored and age and gender specific for black adolescent girls aimed at changing their attitudes toward being more physically active. In addition, a program evaluation of the project was conducted at the end of the 12 week program. This chapter provides an interpretation and discussion of the findings as well as implications for nursing practice, limitations and recommendations for future research.

Interpretation and Discussion of Findings

Participation in the program did not increase positive attitudes towards physical activity nor greater intentions to engage in physical activity among black adolescent girls. Although no significant findings were noted with respect to improving attitudes, previous studies (Boyington et al., 2008; Grieser et al., 2006; Keresztes, Piko, Gibbons, & Spielberger, 2009; Lewis-Moss et al., 2008; Nelson, Benson, & Jensen, 2009) have shown that attitudes influence one's level of participation in physical activity. Attitudes are shaped by our experiences and beliefs, therefore, positive or pleasant experiences associated with physical activity are important. Making the program fun and enjoyable was aimed at improving attitudes toward physical activity. Although, the program evaluations were positive and most comments indicated

enjoyment of the intervention, the enjoyment scores did not significantly change after the intervention. Enjoyment has been noted in other studies (Barr-Anderson et al., 2008; Dishman, Motl, Saunders et al., 2005; Moore et al., 2009; Motl et al., 2001; Robbins et al., 2004; Schneider & Graham, 2009; Wininger & Pargman, 2003) to be a key for maintaining ongoing physical activity levels especially in adolescent girls.

As previously stated, intention to being physically active is related to attitude. There were positive clinical changes noted with more intention to engage in physical activity after the intervention. Clinical changes noted with intention are important to support participation in physical activities. Prior studies have shown that interventions to enhance intention are important for improving physical activity behavior (Dishman et al., 2006; Hagger et al., 2002; Motl et al., 2002; Shen et al., 2008).

The secondary goal was to examine the extent to which participation in the program increased black adolescent girls' participation in physical activity and physical fitness. *Hypothesis 2:* There was no significant improvement in BMI, fitness or physical activity levels. However, trends indicated a clinically relevant gain from pre to post intervention. The lack of improvement in weight and the slight increase in weight over time may be related to changes associated with puberty and hormonal changes that girls normally experience. The findings are consistent with other intervention studies with adolescent girls, where the program was favorable, but findings were not statistically significant for changes in BMI and physical activity levels (Bayne-Smith et al., 2004; Neumark-Sztainer et al., 2003; Robbins et al., 2006; Young, Phillips et al., 2006). Those studies suggest that the intervention in the current study may have been too short to

identify significant improvement. A second factor that may have contributed to the lack of significance in this intervention study is the dose level of the intervention. The dosage of this program was 60 minutes, once per week for 12 weeks. Once a week, for twelve weeks may not have been adequate to show changes in BMI, fitness and physical activity levels. Time frames for other studies have ranged from 12 weeks to 8 months.

Pedometer steps were used to assess changes in physical activity levels. Surprisingly, there were no changes noted in pedometer readings from week 2 to week 8. In fact, walking decreased from week 2 to week 8. In comparison to other studies, the pedometer readings for this study were much lower with walking steps in other studies (Flohr, Todd, & Tudor-Locke, 2006; Le Masurier et al., 2005; Rowe, Mahar, Raedeke, & Lore, 2004; Tudor-Locke & Bassett, 2004). This indicates participants in this study were sedentary. Research supports that less than 5,000 steps per day is considered sedentary, especially in adolescent girls who steps per day should be more than 10,000 per day (Treuth et al., 2003). Reasons for this finding as reported by the girls were a) participants in this study forgot to wear the pedometer, b) misplaced it on some days, and c) did not wear it when they had on a dress because of no place to clip the pedometer on current adolescent clothing. Thus pedometers may not have been an effective measure of physical activity in this subpopulation. Or more creative measures should be used to ensure that the pedometers are worn daily as required. Using electronic technology such as cell phone alerts, phone apps or tweeting reminders to check and wear one's pedometer may result in better compliance of the pedometers among adolescents.

Timing of the study may have impacted findings. The start of summer vacation during week 8 may have contributed to the participants being less physically active. During the school term, some of the girls were involve with a team sport (basketball, track, soccer or volleyball) or was either enrolled in physical education classes. Once school was out for summer vacation, the participants became less active and this may explain the decreased METs scores at week 12 of the intervention. A study by Carrel et al (2007) showed that fitness decreased during summer vacation and highlighted the importance of sustaining physical intervention program beyond schools hours.

In addition, to using the pedometer to note changes in physical activity, this measure was used as one of the goal-setting strategies, which in previous studies had motivated the participants to be more active (Shimon & Petlichkoff, 2009). Participants were asked to set a goal of how many steps they wished to walk each day and to increase that number each day by at least 500 more steps. During week 8, participants were asked to set goals that exceeded their steps walked during week 2 of the intervention. Goal setting was used as a strategy to help promote physical activity. Other studies have shown goal setting as an important facilitator of behavior change (Dishman et al., 2006; Shilts et al., 2004b; Young, Phillips et al., 2006). Goal setting enhances self-efficacy and intention to change a behavior (Dishman et al., 2006). A study by Dishman et al (2006) revealed that individuals with high self-efficacy set higher goals, therefore self-efficacy scores were considered for the effectiveness of goal setting. Positive changes were noted in self-efficacy scores pre to post intervention. Many of the participants set goals that were SMART (specific, measurable, attainable, relevant and time-specific). Some of the

goals set were to walk 1 mile on Saturdays and Sundays on the school track near their home, to walk on the tread-mill for 30 minutes on Tuesdays and Thursdays, and to ride their bikes around their neighborhood for 20-30 minutes on Saturdays. One girl had a goal to increase the number of weights she was lifting from 20 to 40 lbs by the end of the summer. When goals are set and achieved this increases the intention toward performing a specific behavior. The response from the program evaluation showed that 86.1% of participants felt the program was effective in helping them to set goal to increase their level of physical activity. Also, there was an increase noted in vigorous intensity activities across all 3-time points. However, there is no clear evidence that the physical activity change was related to the participants setting goals to be more active.

Hypothesis 3: The final analysis explored the relationship between family and friends on improving physical activity levels of black adolescent girls. There was a significant relationship with baseline family support and one physical activity measures (METs midpoint scores). This finding is similar to a study by Dowda et al (2007) that showed girls with higher perceived support were more likely to have higher total METS compared to girls who had lower perceived family support. Other studies have shown that girls with supportive parents and parents' who model physical activity have higher physical activity levels (Adkins et al., 2004; Bauer et al., 2008; Davison, Cutting, & Birch, 2003; Kuo et al., 2009; Ornelas, Perreira, & Ayala, 2007). Participants with positive changes noted in selected physical activity variables from pre to post intervention were from families with higher annual incomes and higher educational levels. These characteristic findings are similar to other studies that have shown that

children/adolescents whose parents' had higher educational levels and higher socioeconomic status are more physically active (Brodersen, Steptoe, Boniface, Wardle, & Hillsdon, 2007; Moore et al., 2008; Wilson, Kirtland, Ainsworth, & Addy, 2004). Girls whose parents have higher income are in a better position to support physical activity programs, pay for dance and karate lessons and live in neighborhoods that offer more accessible physical activity programs and are safer for outdoor physical activities.

Program Acceptability and Feasibility

Although the findings from this study were not statistically significant, several feasibility results emanate from the findings of the pilot study. The F.U.N (Fitness-U-eNjoy) project was designed to capture cultural elements from the black community. Tailoring was successful for content and activities. The program evaluation showed that 97.3% of the participants enjoyed the dance aerobic classes. Dance aerobic were selected at the physical activity due to its popularity with black adolescent girls (Grieser et al., 2008; Olvera, 2008; Robinson et al., 2003) In fact, dance was identified as the most popular physical activity by participants (43.9%) in this study. Didactic sessions addressed keys issues germane to black girls and women that centered on body images and hair maintenance (Boyington et al., 2008; Dietz, 2001). The literature supports that culturally relevant interventions are more effective when they are designed for the populations they serve (Belgrave et al., 2000; Belgrave et al., 2004; Corneille et al., 2005; Dowda et al., 2004; Gans et al., 2003; Kreuter et al., 2003; Kumpfer et al., 2002; Pittman, 2003).

Aspects of context and community involvement were important to successfully conduct and complete the study. All participants involved with the F.U.N project were of black descent to help foster a sense of commonality and interconnectedness. The sessions were held at black churches, which are central to the black community, fostering religiosity. A spiritual theme was taken from Proverbs 22:6 - "Train up a child in the way he should go; and when he is old, he will not depart from it." The spiritual theme was directed more at the parents and church leaders to emphasize the importance of significant others in young girls lives to influence healthy life style choices, such as being physically active. The program received large support from the church and excellent evaluations from the participants with 91.7% of participants recommending the program to friends and family (see Table 18). The support and commitment of the two churches utilized in this study highlights the effectiveness and feasibility of the church as a resource that is accessible, community-based and culturally relevant in meeting the healthcare needs of black communities. The church leaders were amenable to the program being held at the church and recruitment and attendance were not a problem. Leaders and church liaison were very helpful and supportive. Both churches had adequate space to conduct such a program. Therefore, church-based physical activity programs could ensure accessible programs that are free or affordable to church and community members. In addition, a church community can also provide the family and social support that is essential for on-going physical activity. A majority (83%) of the participants felt that the church was a good place to have a physical activity program and 77.8% agreed that physical activity programs are needed in our communities. In addition,

retention was enhanced by scheduling activities concurrent with parental participation in church activities in the evenings.

Educating young girls and the community about the importance of regular ongoing physical activity is important. The didactic sessions with information sharing and discussion were very well received with 100% of participants agreeing that the educational sessions were helpful and informative. Many of the family members voiced support of the program and suggested that future programs should include parents as well. The interest of many of the mothers to be included in future programs, spoke well of the program. Including the mothers may also help motivate the girls to stay active and offer support to each other. The preliminary findings support the acceptance and successful implementation of similar programs in other churches. Recommendations would include: ensuring that the culture components are built upon and remain intact throughout implementation; work closely with church leaders and establish a good rapport; extend the time frame of the program and expand the program to include other family members.

The Theory of Reasoned Action

The Theory of Reasoned Action (TRA) was the guiding framework for this study. The focus of the intervention was on making physical activity fun and enjoyable in an effort to use pleasurable stimuli to change or improve attitudes toward physical activity. The intervention involved interactive sessions coupled with a physical activity session. Socializing is important to adolescent girls and the interactive sessions allowed the girls

to interact with one another, while discussing benefits and advantages to being physically active. Clinical significance was noted for improvement in attitudes, self-efficacy and intention. Trends showed an increase in vigorous intensity activities from moderate intensity activities across all 3-time points of data collection, which may suggest some change in attitudes toward increased physical activity intensity. Although findings for this study were not statistically significant, other studies have shown attitude to be the key influence in the formation of intentions to participate in physical activity (Dishman et al., 2006; Fila & Smith, 2006; Shen et al., 2008; Simon et al., 2004; Swanson et al., 2006). An association between family support and physical activity (midpoint METs) supported the importance of family in promoting and supporting physical activity. This is similar to a significant finding reported by Martin et al (2005) indicating that both attitude and subjective norms were predictive of intention for increasing moderate to vigorous physical activity in black youth. The key constructs of the TRA (see Table 6) are evident in this study and several clinically relevant improvements were noted from pre to post intervention. The TRA has been used successfully to predict intention to participate in physical activity and physical activity behavior (Ajzen et al., 2007; Hagger & Chatzisarantis, 2008; Hagger et al., 2002; Martin et al., 2005) and was useful in to guiding selection of concepts, intervention focus and evaluation outcomes in this study. Hypothesis testing did not fully support the model, but the feasibility study provided partial support for clinical findings.

Limitations of the Study

Several issues limit the usefulness of the hypothesis testing results. The lack of no control group for comparison of intervention effect limits implications from the feasibility study. Seasonal timing of the intervention may have had an impact on the statistical results. The events around summer vacation may have altered the girls' physical activity levels in comparison to physical activity levels during the regular school term. The intervention was for 12 weeks, which may be a short period in comparison to other studies, with no follow-up to determine maintenance of improvement trends. Lastly, physical activity measures were self-reported which may have resulted in physical activity levels being under or over reported due to poor recall or participants desire to report socially desirable responses.

Implications for Nursing

Physical activity is an important component of overall health. Maintaining an appropriate level of physical activity is essential in preventing or reducing obesity and other health related problems, thereby, leading to healthier outcomes. Fostering physical activity during adolescence can establish healthy habits that carry into adulthood. Therefore, the first implication derived from this study is that attitudes must be considered when planning or discussing physical activity levels with adolescents. Assessing a person's attitude toward physical activity can help guide how nurses counsel or recommend physical activity programs. Understanding a person's attitude about physical activity may be the first step in counseling and educating them about physical

activity. It is critical that healthcare providers understand the importance of regular physical activity. All healthcare providers should become familiar with the physical activity guidelines and prescribe or recommend a physical activity plan for their patients (USDHHS, 2009). School health nurses and nurse practitioners should assess and discuss with their clients about physical activity and assist them to set SMART (specific, measureable, attainable, realistic and timely) goals regarding physical activity (Anonymous, 2010; Locke & Latham, 2002).

Ensuring that physical activity programs are culturally sensitive is the second implication derived from this study. This program was well received by the girls and incorporating culturally relevant components into the study made it more appealing to the girls and family members. Clearly, programs that are more culturally appropriate would be more effective (Kreuter et al., 2003). Consideration of specific activities, in this case dance, the interconnectedness of friends and family, the importance of hair maintenance and the spirituality of the church are some key elements that facilitate the effectiveness of an intervention program for black girls.

The study showed that families were an important factor in adolescent participating and maintaining physical activity levels. This finding supports the essential of including parents in the development and implementation of intervention aimed at increasing physical activity of adolescents. Therefore, parents should be part of plans directed at improving physical activity in adolescents. Physical activity programs should be designed to encourage social support and feedback from family and friends. Provide parents with information and strategies that could help their child to be more physically

active. Being familiar with what is available in the community that could help foster physical activity in this population. Programs, such as, Eat Smart, Move More North Carolina, a statewide movement that promotes increased opportunities for healthy eating and physical activity wherever people live, learn, earn, play and pray, is one resource. Other programs targeted to youth are the *We Can!* (**W**ays to **E**nhance **C**hildren's **A**ctivity & **N**utrition), a national movement designed to give parents, caregivers, and entire communities a way to help children 8 to 13 years old stay at a healthy weight sponsored by National Heart, Lung, and Blood Institute. And *Girls on the Run*, a youth development program for pre-teen girls combines an interactive curriculum and running to inspire self-respect and healthy lifestyles.

Recommendations for Future Research

There have been few studies conducted in black adolescent girls. Therefore, future studies are greatly needed to identify effective and culturally appropriate intervention strategies for this age group that improve physical activity levels. Most of the studies conducted in children and adolescent have been school-based (Barnett et al., 2009; Bayne-Smith et al., 2004; Dishman, Motl, Saunders et al., 2005; Neumark-Sztainer et al., 2003; Pate et al., 2005; Young, Johnson et al., 2006). Further explorations of physical activity programs that are faith-based and community-based are needed that extend physical activity programs beyond the school setting and traditional academic term (Barry et al., 2006; Bopp et al., 2009; Whitt-Glover et al., 2008).

The expansion of this study to include a control group and randomization of participants to either a control or intervention group with a large sample size is recommended. Re-evaluation in 3 to 6 months to examine long-term effects of the intervention program is also warranted to help yield more information about the effectiveness of such a program. The use of more objective measures of physical activity such as accelerometers would increase accuracy of physical activity measurement.

A longer, more intensive intervention may be needed to show statistically significant results in reducing BMIs and improving fitness and physical activity levels (Bayne-Smith et al., 2004; Neumark-Sztainer et al., 2003; Robbins et al., 2006; Young, Phillips et al., 2006). However, there is lack of consistency of how much and how long to conduct physical activity programs. In other words, what intensity, type and duration of physical activity are needed to achieve disease control and reduce chronic health problems among this population? Therefore, more research is needed to determine what dose of physical activity is needed to achieve the desired effect. A few studies have attempted to address this issue but more are needed (Church, Earnest, Skinner, & Blair, 2007; Lee, 2007).

Another measure to improve the outcome of this and future study is to add to the theoretical framework. In addition to considering attitudes, a multi-disciplinary approach is warranted. Experts recommend using a multilevel approach to understanding and promoting physical activity beyond individual influences. The Social Ecological Model (SEM) can provide an effective way to organize theoretical constructs aimed at adopting and maintaining physical activity behavior (Ward et al., 2007). Health is influenced by

multiple factors, thus, it is reasonable to assume that in order to develop an intervention aimed at increasing physical activity; a model is warranted that considers multiple levels of influences. The SEM is a model of health behavior that identified five levels of influence. The five levels of influence are: intrapersonal, interpersonal, organizational, community and public policy influences (McLeroy, Bibeau, Steckler, & Glanz, 1988). The SEM consider the connections between people and their environments, and may be more effective for integrating the many known modifiable correlates of physical activity than the Theory of Reasoned Action.

In the open discussion session with the girls, a repeated theme on why girls did not participate in physical education (PE) classes was due to the feeling that PE was designed for boys. The school did not offer activities enjoyable to girls. A few studies have shown that most girls prefer non-competitive activities [dance, aerobics, & yoga] (Craike, Symons, & Zimmermann, 2009; Kien & Chiodo, 2003; Vu et al., 2006). Therefore, identifying gender specific activities may be an important research focus that could improve physical activity levels in adolescent girls.

More studies, especially in this population are needed to show interventions can be designed to change intention by affecting attitude and subjective norm to promote specific health behavior, such as increased physical activity levels. An expanded intervention, measurement, and evaluation study is needed to enhance and assess long-term program effectiveness.

Although, the hypothesis testing did not yield statistically significant results, the primary goal of this study was to conduct a feasibility test of a program that was culturally tailored and age and gender specific that would change attitudes of black

adolescent girls toward increased participation in physical activity. Therefore, clinically relevant findings and program evaluation and feedback from this study can be used to develop future interventions. Such a program is very much needed and may yield significant findings in the near future. Limitations can be removed by initiating programs during the school year, refocusing activities like daily logs, and using control or usual care group to compare intervention impact in a physical activity program for adolescents based in the church setting.

Summary

Adolescence is a period of transition in which health habits and beliefs are adopted, therefore, fostering physical activity in adolescence can help establish healthy habits that could carry over into adulthood. Black adolescent girls have a higher prevalence of being physically inactive in comparison to other ethnic and gender groups (CDC, 2010; LaFontaine, 2008). Although the findings from this study were not statistically significant, the intervention created an interest in the girls for the need and continuation of such programs as reflected in the retention of girls in the program. Clinically relevant trends showed positive changes in attitude, self-efficacy, and intention. Trends in physical intensity levels from moderate to vigorous were noted, and positive changes in BMI, METs and fitness levels were found post intervention.

Conducting culturally tailored physical activity programs in black churches aimed at black adolescent girls are feasible and needed to reduce the alarming decline in physical activity during adolescence and the associated increased in prevalence of

obesity, high blood pressure and heart disease among this population. Physical activity is needed throughout all walks of life and efforts need to start now versus later in life. As disparities in the African American population and subgroup continue with obesity, heart disease, diabetes, and other conditions that could improve with physical activity, immediate action is needed from governmental officials, school boards and communities to improve physical activity of black adolescent girls in order to eliminate or reduce the health care disparities. Improving physical activity levels among children and adolescent may be the most cost-effective health promoting primary prevention strategy.

Let's have **F.U.N** together

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APPENDIX A. CONSENT & ASSENT FORMS



THE UNIVERSITY *of* NORTH CAROLINA
GREENSBORO

School of Nursing

PARENTAL / GUARDIAN CONSENT

FOR CHILD UNDER 18 TO PARTICIPATE IN A RESEARCH STUDY

Project Title: A Church-Based Intervention to Promote Physical Activity in Black Adolescent Girls

Investigator(s): Jie Hu, PhD, RN

Wanda M. Thompson, RN, MSN, WHNP-BC

Participant's Name: _____

What is the study about?

This research study is to help us learn more about ways to improve physical activity levels among Black adolescent girls.

Why are you asking my child?

Your child is being asked because she is a Black adolescent girl between the ages of 12 years to 18 years and has no physical limitation or medical conditions that would prevent her from participating in physical activities like walking, jumping rope, or riding a bicycle. A positive completion of the Physical Activity Readiness Questionnaire (PAR-Q) that you and your daughter completed during the information session established her eligibility for this study. The PAR-Q was used to determine your daughter's readiness and/or ability to participate in physical activity.

What will you ask my daughter to do if I agree to let her be in the study?

If you and your daughter are in agreement that she can be in the study, she will be asked to meet with Wanda Thompson, a PhD nursing student, and participate in a 12 week program that includes health information and opportunities to be physically active. Your daughter will be asked to:

1. Complete the following surveys:
 - Demographic questionnaire
 - Health profile questionnaire
 - Adolescent Physical Activity Recall Questionnaire (APARQ)
 - It's All About F.U.N questionnaire (48 items)The questionnaire/survey should take about 30 to 40 minutes to complete.
2. Keep a daily log of her physical activities for the entire 12 weeks.
3. Wear a pedometer which is a small battery operated device that counts all of her footsteps during week 2 and week 8 (Wednesday to Wednesday).
4. Participate in a 60 minute weekly class held at the church for 12 weeks lead by Wanda Thompson, PhD nursing student. This class will be with other girls like your daughter and include 30 minutes of information and time for the girls to talk, and 30 minutes of a dance aerobics class taught by a certified aerobics instructor. In addition, your daughter will be encouraged to engage in other physical activities that she enjoys doing at least 30 minutes, 3-4 times per week.
5. We will obtain measurements of your daughter's: height, weight, blood pressure and VO_2 max (to estimate fitness) three times during the 12 week program. These measurements will be obtained the 1st week of the study, the 6th week, and the last week.
6. A Polar Heart Monitor (*PHM*), which is a small wrist-watch device, will be used to obtain your daughters heart rate at the beginning of the study (week 1), midway (week 6) and at the end of the study (week 12). The purpose of the polar heart monitor is to obtain an estimation of *maximal aerobic power or VO_2 max*. *VO_2 max* is the amount of oxygen a person body uses during exercise, and an estimation of *VO_2 max* is a good way to predict your daughter's fitness level. The receiver and recorder for the PHM resemble a wrist-watch and are worn on the wrist like a watch. To obtain the readings from the PHM your daughter will be required to lie quietly on a cot/bed for 5 minutes. The transmitter is small and light weight and is held in place by an elastic strap that will be placed around the upper chest along the bra line. The procedure is harmless and takes only 5 minutes to complete.
7. As a parent or legal guardian you are also being asked to consent to provide demographic information regarding your educational level, household income and family status.

Is there any audio/video recording of my child? No

What are the dangers to my child?

Potential risks or harm involved in this study are minimal. The risks involved in this study are not any different than when girls exercise in gym class or at home. Some risks may include:

- If this is her first time engaging in any form of physical activity she may become a little tired or winded the first day or so. Her muscles may become a little sore the first 2-3 days, but that will get better with consistent activity.
- She may avoid injury by performing all activities at her own pace and following the directions of the certified aerobics instructor.
- The intent of this project is to increase physical activity levels; it is *not* a weight loss program, although that may be a benefit. Your daughter might become disappointed if she does not lose weight during the program.
- If an injury occurs while participating in this program, Wanda Thompson, the PhD nursing student researcher, will refer your daughter to her primary care provider, local clinic or emergency department. In any emergency situation, such as unconsciousness, injuries, uncontrollable visible bleeding, or severe pain, 911 will be called. The parent/guardian emergency contact will be immediately notified if any injury occurs. A log of injuries will be kept by the primary investigator, Jie Hu, PhD, RN.
- The University of North Carolina at Greensboro is not financially responsible for any doctor, hospital or medical bills that may occur from participating in this study.

Are there any benefits to your daughter for taking part in this research study?

A benefit means that something good happens. Some potential benefits for your child may be:

- A more favorable attitude toward physical activity
- Building healthy bones, muscles and joints
- Controlling weight and reduction in fat
- Preventing or delaying problems with one's blood pressure
- Increased energy levels
- Decreased risk for cardiovascular disease and diabetes

Are there any benefits to society as a result of my daughter taking part in this research?

The information we learn from this study may help nurse researchers and other health care providers have a better understanding of how to improve the physical activity level of Black adolescent girls which would improve their health. Ultimately increasing the physical activity level of Black adolescent girls and improving their health may prevent high blood pressure, obesity, and diabetes.

Will I or my daughter get paid for being in the study? Will it cost me anything?

This study will not cost you or your daughter anything but her time. Your child will receive a \$20.00 Northgate gift card for completing all survey materials on the first day, a \$20.00 Northgate gift card at midpoint (6th week), and a \$40.00 Northgate gift card at the end of the study. More than 2 missed sessions will disqualify your daughter from receiving the \$40.00 at the end of the study. Plus gift incentives, such as a water bottle or t-shirt, will be given to your child for meeting set physical activity goals during the study. Parents/guardians will receive \$ 60.00 worth of gas cards to be disturbed as follows: \$ 10.00 (week 1), \$25.00 (week 6) and \$ 25.00 (week 12).

How will you keep my daughter's information confidential?

All information obtained in this study is strictly confidential unless disclosure is required by law. Your name (parent/guardian) will only be on the consent form and receipts for gas/gift cards. Your child's name will only be on the assent form and receipts for gas/gift cards. Your child's name and any identifying information will not be shared with anyone but the researchers. All other papers will have a code number in place of your daughter's name. A master list matching your daughter's name to the identification code number will be kept in a locked file cabinet in the primary investigator's office at the University of North Carolina at Greensboro School of Nursing. Also, all consent and assent forms and receipts will be kept in the primary investigator's office in a locked file cabinet. All other papers with your daughter's code number will be kept separate from the master identification list, consent forms, assent forms, and receipts for gas/gift cards. They will be kept separate from consents forms and locked in boxes for transport to UNCG for data input.

Data will be entered into computer databases on password protected, fire walled computer accounts, and stored on password protected servers and disks. A coding system will be used for all data response forms and computer data. Computer disk files will be kept locked in filing cabinets in locked rooms. Data will be available only to the research team members. We are required to keep consent and assent forms and receipts for 3 years after the study is finished. After that time, we will destroy all the forms.

What if my child wants to leave the study or I want her to leave the study?

You have the right to refuse to allow your child to participate or to withdraw her at any time, without penalty. Your child has the right not to answer any question. If your child does stop being in the study, it will not affect you or your child in any way. If you or your child chooses to withdraw, you may request that any data which has been collected be destroyed unless it is in a de-identifiable state.

What about new information/changes in the study?

If significant new information relating to the study becomes available which may change your mind or your daughter's mind about being in the study, this information will be provided to you.

You can ask questions at any time. You can talk to me or you can talk to someone else at any time during the study. Here are the telephone numbers to reach us:

Jie Hu, PhD, RN	(336) 256-1025	Jie_Hu@uncg.edu
(PI Name)	Phone Number	E-mail address
Wanda Thompson, RN, WHNP-BC	(919) 971-6151	wmthomps@uncg.edu
(Researcher Name – PhD Nursing Student)	Phone Number	E-mail address
Mr. Eric Allen	336-256-1482	Office of Research and Compliance
(Institutional Review Board – Contact at UNCG)	Phone Number	

Voluntary Consent by Participant:

By signing this consent form, you are agreeing that you have read it or it has been read to you. You fully understand the contents of this document and consent to your child taking part in this study. In addition, you agree to provide demographic information regarding yourself and your household. All of your questions concerning this study have been answered. By signing this form, you are agreeing that you are the legal parent or guardian of the child who wishes to participate in this study described to you by Wanda Thompson.

_____	_____
Participant's Parent/Legal Guardian's Signature	Date

_____	_____
Participant's Signature	Date

APPENDIX A. CONSENT & ASSENT FORMS



THE UNIVERSITY of NORTH CAROLINA
GREENSBORO

School of Nursing

Assent Form

Study Title: A Church-Based intervention to Promote Physical Activity in Black Adolescent Girls

Investigator(s): Jie Hu, PhD, RN
Wanda M. Thompson, RN, MSN, WHNP-BC

My name is Wanda Thompson

What is this about?

The study is looking at ways to improve physical activity levels in Black adolescent girls.

Did my parents say it was ok?

Your parent(s)/guardian said it was okay for you to be in this study and have signed a form like this one.

Why me?

We would like you to take part in this study because you are a Black adolescent girl with no medical problems or conditions that will prevent you from participating in physical activity. The Physical Activity Readiness Questionnaire (PAR-Q) that you completed during the information session established your readiness and/or ability to participate in physical activity. Therefore, you are eligible to participate in this study.

What if I want to stop?

You don't have to be in this study. It is completely up to you. If you say okay now, but you want to stop later, that's okay too. All you have to do is tell us. Participation in this study is

completely voluntary and you may withdraw at any point and time during the study without any consequences.

What will I have to do?

You will be asked to do the following if you agree to participate in the study:

1. Complete the following surveys which should take about 30 to 40 minutes to complete:
 - Demographic questionnaire
 - Health profile questionnaire
 - Adolescent Physical Activity Recall Questionnaire (APARQ)
 - It's All About F.U.N questionnaire (48 items)
2. Keep a daily log of your physical activities for the entire 12 weeks.
3. Wear a pedometer which is a small battery operated device that counts all of your footsteps during week 2 and week 8 (Wednesday to Wednesday).
4. Participate in a 90 minute weekly class held at the church for 12 weeks lead by Wanda Thompson, PhD nursing student. This class will be with other girls like yourself and include 45 minutes of information and discussion sharing, and 45 minutes of a dance aerobics class taught by a certified aerobics instructor each week. In addition, you will be encouraged to engage in other physical activities that you enjoy doing at least 30 minutes, 3-4 times per week.
5. Your height, weight, blood pressure and VO_2 max (fitness measurement) will be obtained 3 times during the study (week 1, week 6th & week 12th).
6. A Polar Heart Monitor (*PHM*), which is a small wrist-watch device, will be used to obtain your heart rate at the beginning of the study (week 1), midway (week 6) and at the end of the study (week 12). The purpose of the polar heart monitor is to obtain an estimation of *maximal aerobic power or VO_2 max*. VO_2 max is the amount of oxygen a person body uses during exercise, and an estimation of VO_2 max is a good way to predict your fitness level. The receiver and recorder for the PHM resemble a wrist-watch and are worn on the wrist like a watch. To obtain the readings from the PHM you will be required to lie quietly on a cot/bed for 5 minutes. The transmitter is small and light weight and is held in place by an elastic strap that will be placed around your upper chest, just under your bra. The procedure is harmless and takes only 5 minutes to complete.

Will anything bad happen to me?

The potential risks or harm involved in this study are minimal. The risks involved in this study are not any different than when girls exercise in gym class or at home. Some risks may include:

- If this is your first time engaging in any form of physical activity you may become a little tired or winded the first day or so. Your muscles may become a little sore the first 2-3 days, but will get better with consistent activity.
- You can help avoid injuries by stretching and performing all activities at your own pace and limitations.
- The intent of this study is to increase your physical activity level; it is not a weight loss program, although that may be a benefit. Do not be disappointed if you do not see any weight loss.
- If an injury occurs while participating in this program, Wanda Thompson, the PhD student researcher, will refer you to your primary care provider, local clinic or emergency department. In any emergency situation such as unconsciousness, injuries, uncontrollable visible bleeding, or severe pain, 911 will be called. Your parent/guardian emergency contact will be notified immediately if any injuries occur. A log of injuries will be kept by the primary investigator, Jie Hu, PhD, RN.
- The University of North Carolina at Greensboro is not financially responsible for any doctor, hospital or medical bills that may occur from injuries resulting from participating in this study.

Will anything good happen to me?

A benefit means that something good happens. Some potential benefits for you may be:

- A more favorable attitude toward physical activity. You may find that you like being physically active.
- Building healthy bones, muscles and joints
- Controlling weight and reduction in fat
- Increased energy levels
- Preventing or delaying problems with one's blood pressure
- Decreased risk for cardiovascular disease and diabetes

The information we learn from this study may help nurse researchers and other health care providers have a better understanding of how to improve the physical activity level of Black adolescent girls which would improve their health. Ultimately increasing the physical activity level of Black adolescent girls and improving their health may prevent high blood pressure, obesity, and diabetes.

Do I get anything for being in this study?

You will receive a \$ 20.00 Northgate gift card for completing all survey materials on the first day, a \$20.00 Northgate gift card at midpoint (6th week), and a \$ 40.00 Northgate gift card at the end of the study. If you miss more than 2 sessions you will be disqualified from receiving the \$40.00 at the end of the study. Plus there will be gift incentives such as a water bottle or t-shirt for meeting your physical activity goals during the study. Parents/guardians will receive \$ 60.00 worth of gas cards to be distributed as follows: \$ 10.00 (week 1), \$25.00 (week 6) and \$ 25.00 (week 12).

What if I have questions?

You can ask questions at any time. You can talk to me or you can talk to someone else at any time during the study. Here are the telephone numbers to reach us:

Dr. Jie Hu	(336) 256-1025	Jie_Hu@uncg.edu
(PI Name)	Phone Number	E-mail address
Wanda Thompson, RN, WHNP-BC	(919) 971-6151	wmthomps@uncg.edu
(Researcher Name)	Phone Number	E-mail address
Mr. Eric Allen	336-256-1482	Office of Research and Compliance
(Institutional Review Board – Contact at UNCG)	Phone Number	

What if I want to leave the study?

You may stop or leave the study at anytime without any consequences. Your participation is completely voluntary. You also have the right not to answer any question.

If you understand this study and want to be in it, please write your name below.

Signature of child

Date

APPENDIX B. SURVEY TOOLS & PROGRAM EVALUATION

Id # _____ Circle the number that describe your best response

"It's About F.U.N"

PACES	Strongly Disagree	Disagree	Neutral Or Undecided	Agree	Strongly Agree
1. I enjoy it when I am active.	1	2	3	4	5
2. I feel bored when I am active.	1	2	3	4	5
3. I dislike it when I am active.	1	2	3	4	5
4. I find it pleasurable when I am active.	1	2	3	4	5
5. It's no fun at all when I am active.	1	2	3	4	5
6. My body feels good when I am active.	1	2	3	4	5
7. When I am active it makes me depressed.	1	2	3	4	5
8. When I am active it gives me energy.	1	2	3	4	5
9. When I am active it's very pleasant.	1	2	3	4	5
10. When I am active I get something out of it.	1	2	3	4	5
11. When I am active it's very exciting.	1	2	3	4	5
12. When I am active it frustrates me.	1	2	3	4	5
13. When I am active I feel as though I would rather be doing something else.	1	2	3	4	5
14. Being active is not at all interesting.	1	2	3	4	5
15. Being active gives me a strong feeling of success.	1	2	3	4	5
16. Being active feels good.	1	2	3	4	5

1



UNCG

Id # _____

Circle the number that describe your best response

"It's About F.U.N"

SE	Strongly Disagree	Disagree	Neutral Or Undecided	Agree	Strongly Agree
17. I can be physically active during my free time on most days.	1	2	3	4	5
18. I can ask my parent or other adult to do physically active things with me.	1	2	3	4	5
19. I can be physically active during my free time on most days even if I could watch television or play video games instead.	1	2	3	4	5
20. I can be physically active during my free time on most days even if it is very hot or cold outside.	1	2	3	4	5
21. I can ask my best friend(s) to be physically active with me during my free time on most days.	1	2	3	4	5
22. I can be physically active during my free time on most days even if I have to stay at home.	1	2	3	4	5
23. I have the coordination I need to be physically active during my free time on most days.	1	2	3	4	5
24. I can be physically active during my free time on most days no matter how busy my day is.	1	2	3	4	5

Id # _____ Circle the number that describe your best response

"It's About F.U.N"

A	Strongly Disagree	Disagree	Neutral Or Undecided	Agree	Strongly Agree
25. Being physically active helps me cope with stress.	1	2	3	4	5
26. Being physically active is fun.	1	2	3	4	5
27. Being physically active is a good way for me to make new friends.	1	2	3	4	5
28. Being physically active is a good way for me to stay in shape.	1	2	3	4	5
29. Being physically active gives me more energy.	1	2	3	4	5
30. Being physically active would make me more attractive.	1	2	3	4	5
31. Being physically active makes me too hot and sweaty.	1	2	3	4	5
32. Being physically active makes me better in sports, dance or other activities.	1	2	3	4	5
33. Being physically active takes too much of my time.	1	2	3	4	5
34. Concerns about my hair keeps me from being more physically active.	1	2	3	4	5
35. Being physically active is good for my health.	1	2	3	4	5
36. You only need to be physically active if you are trying to lose weight.	1	2	3	4	5

Id # _____ Circle the number that describe your best response

"It's About F.U.N"

I	Strongly Disagree	Disagree	Neutral Or Undecided	Agree	Strongly Agree
37. I <i>intend</i> to be physically active during my free time on most days.	1	2	3	4	5
38. I <i>will</i> be physically activity during my free time on most days.	1	2	3	4	5
39. I <i>plan</i> to be physically active during my free time on most days.	1	2	3	4	5
40. I am <i>going</i> to be physically active during my free time on most days.	1	2	3	4	5

Note: The responses are different for the next section.

During a typical week (7-days), how often has a member of your immediate family (parents, guardian, grandparents, or siblings). . .	None	1-2 days per week	3-4 days per week	5 or more days per week
1. Provided transportation to a place where you can do physical activities or play sports?	1	2	3	4
2. Watched you participate in physical activities or sports?	1	2	3	4
3. Told you that you are doing well in physical activities or sports?	1	2	3	4
4. Done a physical activity or played sports with you?	1	2	3	4

Id # _____ Circle the number that describe your best response

"It's About F.U.N"

SS	Strongly Disagree	Disagree	Agree	Strongly Agree
1. My family thinks I should be physically active.	1	2	3	4
2. Someone in my family has been physically active with me in the past 2 weeks.	1	2	3	4
3. Someone in my family has offered to be physically active with me in the past 2 weeks.	1	2	3	4
4. Someone in my family has encouraged me to be physically active.	1	2	3	4
5. A friend has offered to be physically active with me in the past 2 weeks.	1	2	3	4
6. A friend has been physically active with me in the past 2 weeks.	1	2	3	4
7. A friend has encouraged me to be physically active in the past 2 weeks.	1	2	3	4
8. My friends think I should be physically active.	1	2	3	4

The purpose of this questionnaire is to assess your current level of physical activity. Please think about the last 30 days (month) and place the X by the activity that you have performed in the last 30 days and write in the number of times per week you usually do the activity and how much time you spend during the activity. (Note example on first line)

X	Activity or game		Number of times per week you usually do this activity	The usual amount of time you spend doing this activity in minutes
X	Walking		3	60 minutes
	1	Aerobic exercise		
	2	Badminton		
	3	Basketball		
	4	Bicycling (riding my bike)		
	5	Callisthenic		
	6	Circuit training		
	7	Dance (*)		
	8	Dance, Dance Revolution		
	9	Gymnastics		
	10	Exercise Videos		
	11	Fencing		
	12	Ice Skating		
	13	Jumping rope		
	14	Marching Band		
	15	Martial Arts / Karate		
	16	Rocking Climbing Wall		
	17	Rolling Skating		
	18	Running / jogging		
	19	Softball / baseball		
	20	Soccer		
	21	Skateboarding		
	22	Skiing		
	23	Swimming		
	24	Track		
	25	Trampolining		
	26	Tennis		
	27	Volleyball		
	28	Walking		
	29	Water Aerobics		
	30	Water skiing		
	31	Weight Training		
	32	Wii Fitness		
	33	Yoga / Stretching		
	34	Other:		
(*) Dance: Aerobic, Ethnic, Hip Hop, Break dancing, Jazz, Ballet, Line-dancing, Modern, Tap				

Weekly Physical Activity Worksheet

Please think about the last 7 days (**Date to Date**) and fill in the table with the following information:

- ♥ the sports or games you usually do (including training),
- ♥ how many times per week you usually do them, and
- ♥ the usual amount of time you spend doing them.

If you **do not** do any organized activities, please write “zero” in the first row of the table.

Organized Sports and Games

Sports or Games	Number of times per week you usually do this sport or game	The usual amount of time you spend doing this activity
<i>Example: Football</i>	<i>3</i>	<i>2 hours</i>

The following questions are about *Leisure-time Physical Activity* (non-organized) that you have done in the last week. Please list any physical activity you have done after school and on the week-ends:

If you **have not** done any *Leisure-time Physical Activity* (non-organized), please write “zero” in the first row of the table.

Leisure-time Physical Activity (Non-organized)

Physical Activity	Number of times per week you usually do this activity	The usual amount of time you spend doing this activity
<i>Example: Walking</i>	<i>2</i>	<i>30 minutes</i>

This worksheet is consider part of data collection and must be completed and return on Date to receive your gift cards. Thank you for your participation 😊

Regular physical activity is fun and healthy, and increasingly more people are choosing to become more active every day. Being more active is very safe for most people. However, some people should check with their doctor before they start becoming much more physically active. Therefore, the Physical Activity Readiness Questionnaire (PAR-Q) is a pre-screening tool that will be used to determine any potential health risks and ensure that it is safe for your daughter to participate in this study.

By completing this brief pre-screening survey you and your daughter are giving consent/assent to provide this information with the understanding the information will be used to determine if your daughter is eligible to participate in this study. If your daughter answered **Yes** to any of the following question, in her best interest she will not be allowed to participate in this study without written permission from her healthcare provider. Thank you for your time and interest.

The PAR-Q is a pre-screening tool. No information on this survey will be recorded or used for data collection. This sheet will be immediately destroyed at the end of this session.

Common sense is your best guide when you answer these questions. Please read the questions carefully and answer each one honestly: check YES or NO.

Physical Activity Readiness Questionnaire (PAR-Q)	No	Yes
1. Has your doctor ever said you have heart trouble?	<input type="radio"/>	<input type="radio"/>
2. Do you feel pain in your chest when you do physical activity?	<input type="radio"/>	<input type="radio"/>
3. Do you often feel faint or have spells of severe dizziness?	<input type="radio"/>	<input type="radio"/>
4. Has a doctor ever said your blood pressure was too high?	<input type="radio"/>	<input type="radio"/>
5. Has your doctor ever told you that you have a bone or joint problem(s), such as arthritis that has been aggravated by exercise, or might be made worse with exercise?	<input type="radio"/>	<input type="radio"/>
6. Do you suffer from any problems of the lower back, i.e., chronic pain, or numbness?	<input type="radio"/>	<input type="radio"/>
7. Are you currently taking any medications? (not including a birth control method)	<input type="radio"/>	<input type="radio"/>
8. Do you currently have a disability or health problem that would prevent you from participating in physical activity?	<input type="radio"/>	<input type="radio"/>
9. Is there a good physical reason, not mentioned here, why you should not follow an physical activity program?	<input type="radio"/>	<input type="radio"/>

If you answered **NO** to all questions above, it gives a general indication that you may participate in physical and aerobic fitness activities. The fact that you answered NO to the above questions, is no guarantee that you will have a normal response to exercise. However, you are eligible to participate in the study if you so desire.

Demographic Information

Please answer all questions honestly and completely.

1. Date of Birth _____ Age _____
2. What grade are you in? ☐ 6th ☐ 7th ☐ 8th ☐ 9th ☐ 10th ☐ 11th ☐ 12th
☐ Not in school
3. I live with my ___Parents ___Grandma/grandpa ___Aunt /uncle ___Brothers/sisters
Other (specify _____)
4. Is the person you listed in question 3 your legal guardian? Yes ___ No ___
- If no, who is your legal guardian? _____
5. Including you, how many people live in your home? _____
6. Are you involved in any sports? No ___ Yes ___
7. List all sports that you have participate in _____

8. Place a X in the box that best describe your current physical activity level and intensity:

X Code Statement (Mark only 1)

- ☐ (0) I am not physically active.
- ☐ (1) I am physically active more than 3 days per week.
- ☐ (2) When I am physically active, I am active less than 10 minutes per day.
- ☐ (3) When I am physically active, I am active 11-30 minutes per day.
- ☐ (4) When I am physically active, I am active more than 30 minutes per day.
- ☐ (5) I am physically active at least 30 minutes 3-4 days per week.

9. List physical activities you like to do. _____

10. True or false you must be athletic to be physically active. True _____ False _____

11. Do you feel your neighborhood is a safe place to walk or engage in physical activities outside? Please rate on a scale between 1 and 10. (circle response)

Not safe at all

Very safe

1 2 3 4 5 6 7 8 9 10

If feel not safe, please explain _____

12. Do you have access to a recreational center or park where you can participate in regular on-going physical activity?

No _____ if yes _____, What _____

Please give a phone number where you can be reached _____

THANK YOU FOR YOUR TIME IN COMPLETING THIS SURVEY



Remaining area to be completed by researcher

Today's Dates	
Id #	
Site Location	

HR MAX	
220-18=202	-14=206
-17=203	-13=207
-16=204	-12=208
-15=205	

Recording of Measurement data:

Measurement	1 st Week (Pre)	Midpoint (week 6)	Post- (week 12)
Height in centimeters			
Weight in kilograms			
BMI (age & sex specific)			
Blood Pressure (BP)			
Fitness test (PHM)			

Baseline (Relaxation Rates)

DOB: Day____ Month____ Year____ Age____

Week 1			Week 2			Week 3		
	Time	Value		Time	Value		Time	Value
1	0:15		1	0:15		1	0:15	
2	0:30		2	0:30		2	0:30	
3	0:45		3	0:45		3	0:45	
4	1:00		4	1:00		4	1:00	
5	1:15		5	1:15		5	1:15	
6	1:30		6	1:30		6	1:30	
7	1:45		7	1:45		7	1:45	
8	2:00		8	2:00		8	2:00	
Total		/8	Total		/8	Total		/8
Baseline			Baseline			Baseline		

Parents/Guardians Demographic Information

1. Please indicate your family annual income:

- | | |
|--|--|
| <input type="checkbox"/> (1) Less than 15,000 per year | <input type="checkbox"/> (5) 50,000 – 74,999 |
| <input type="checkbox"/> (2) 15,000 – 24,999 | <input type="checkbox"/> (6) 75,000 – 99,999 |
| <input type="checkbox"/> (3) 25,000 – 34,999 | <input type="checkbox"/> (8) more than 100,000 |
| <input type="checkbox"/> (4) 35,000 – 49,999 | |

2. What is your educational background

- | | |
|---|---|
| <input type="checkbox"/> (1) Dropped out of high school | <input type="checkbox"/> (5) Have a Bachelor degree |
| <input type="checkbox"/> (2) Completed 12 th grade | <input type="checkbox"/> (6) Have a Master's degree |
| <input type="checkbox"/> (3) Some college | <input type="checkbox"/> (7) Have a PhD degree |
| <input type="checkbox"/> (4) Have a Associated Degree | |

3. Describe your family structure:

- ☐ (0) Two parent household
- ☐ (1) Single parent household
- ☐ (2) Other, specify_____

"It's All About F.U.N!"



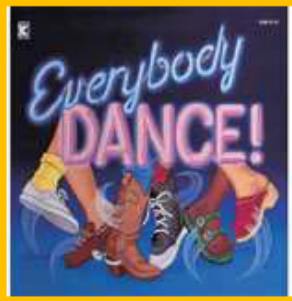
Program Evaluation	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1. The objectives for this program were met.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. My expectations for the program were met.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I will continue to use my physical activity log	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. The educational sessions for this program were helpful and informative.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Physical activity programs are needed in my community.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Having a physical activity program in the church increased my physical activity level.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I have no desire to continue with a physical activity program after this ends.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I would recommend this program to friends and family.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. This program did not meet my expectations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I feel the program was effective in helping me to set goal to increase my level of physical activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. The dance aerobic classes were fun.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. The church is a good location for this type of activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I do not think the church is a good place to do physical activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please provide any additional comments or suggestions.

Thank you for your time and commitment.

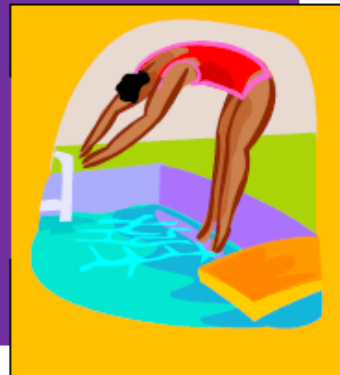
IT'S ALL ABOUT F.U.N

Physical Activity Log Your Passport to Good Health



**Be
Active!**

**HAVE
FUN**



APPENDIX C. PHYSICAL ACTIVITY LOG (PAL)

This Journal Belongs To

Name	
Address	
Phone (Home)	Cell

Personal Health Information

Height =

Measurement	Start	Midpoint	End
Weight			
Blood pressure			
BMI			
VO ₂ max			

Safety Tips

1. Drink water before, during, and after physical activity.
2. Wear supportive sneakers and use sunscreen when outdoors.
3. Listen to your body. Slow down if you're out of breath.
4. Stop exercising right away if you have pain anywhere in your body, if you feel dizzy or sick, or have muscle cramps.

What is Physical Activity?

1. Fun and enjoyable activities that increase your heart rate and burn more energy than when you are resting.
2. Regular physical activity decreases the risk and symptoms of many chronic diseases including Heart Disease, Cancer, Stroke, Hypertension, Osteoporosis and Diabetes.
3. Physical activity should not feel too strenuous or painful. Find an activity that is safe and enjoyable for you.

Physical Activity Recommendation for Adolescents:

- ♥ Should perform 3 types of activity each week, aerobic, muscle-, and bone-strengthening
- ♥ Aerobic should consist of 60 minutes (1 hour) daily with most of the 60 minutes being at either moderate or vigorous intensity at least 3 days a week.
 - Moderate intensity is defined as working hard enough to raise your heart rate and break a sweat.
 - Vigorous intensity aerobic activity means one is breathing hard and fast, and your heart rate has gone up quite a bit, at this level you will not be able to say more than a few words without pausing for a breath.
- ♥ Muscle strengthening activities should be done at least 3 days a week, such as push-ups, resistance exercises with exercise bands and/or weights, rock climbing or sit-ups.
- ♥ Bone-strengthening physical activities should occur at least 3 days of the week, such as hopping, skipping, jumping rope, running and gymnastics to name a few.

- ★ Dance to your favorite music
- ★ Take your dog for a walk
- ★ Jump rope or roller skate
- ★ Walk with a friend around the school track or local mall.
- ★ Be part of a team and play softball, basketball, or soccer
- ★ Play tennis or volleyball
- ★ Go swimming or biking

It does matter what you do, just keep "moving." **Physical activity is rewarding!** It can increase your energy level, lower your risk of many diseases, and improve your emotional well-being and self-esteem. May help reduce your feelings of depression and stress.

For ...	Try ...
Flexibility	Stretching, yoga, swimming
Strength	Gymnastics, lifting weights, sit-ups, push-ups, rowing
Healthy Heart	Aerobic activities like running, jogging, dancing, skating, and biking to name a few.

[illegible]

Goals

Short Term Goals

Write down at least 2 of your own personal short-term goals. What will you do over the next week or two that will help you make physical activity a regular part of your life?

1.

2.

3.

Long Term Goals

Write down at least 2 long-term goals. Focus on where you want to be, for example, in 6 months, a year, or 2 years from now. Remember, setting goals will help you make physical activity part of your everyday life, monitor your progress, and celebrate your success.

1.

2.

3.

Tips to Maintain Physical Activity

Moving while you're watching television – run in place or do jumping jacks during a TV show. Dance during a commercial.

Wear a pedometer to count your daily steps.

Try a new activity each season such as swimming, hiking, or walking.

Do stretching and strengthening exercise for at least 10 minutes during breaks throughout the day.

A little here and there goes a long way! Try fitting 20 minutes of physical activity in the morning, afternoon, and evening into your routine. **Remember:** You need 60 minutes per day.

Make small changes and see how much better you'll feel.

NOTES

Websites:

http://www.hrsa.gov/womenshealth/rural_hepa/young/

<http://www.girlshealth.gov/bones/>

<http://www.cdc.gov/physicalactivity/everyone/guidelines/children.html>

http://www.gogirlworld.org/ggw_flash/index.html

<http://www.girlshealth.gov/parents/bones/activity/index.cfm>

Proverbs 22:6

*Train up a child in the way he should go; and
when he is old, he will not depart from it.*

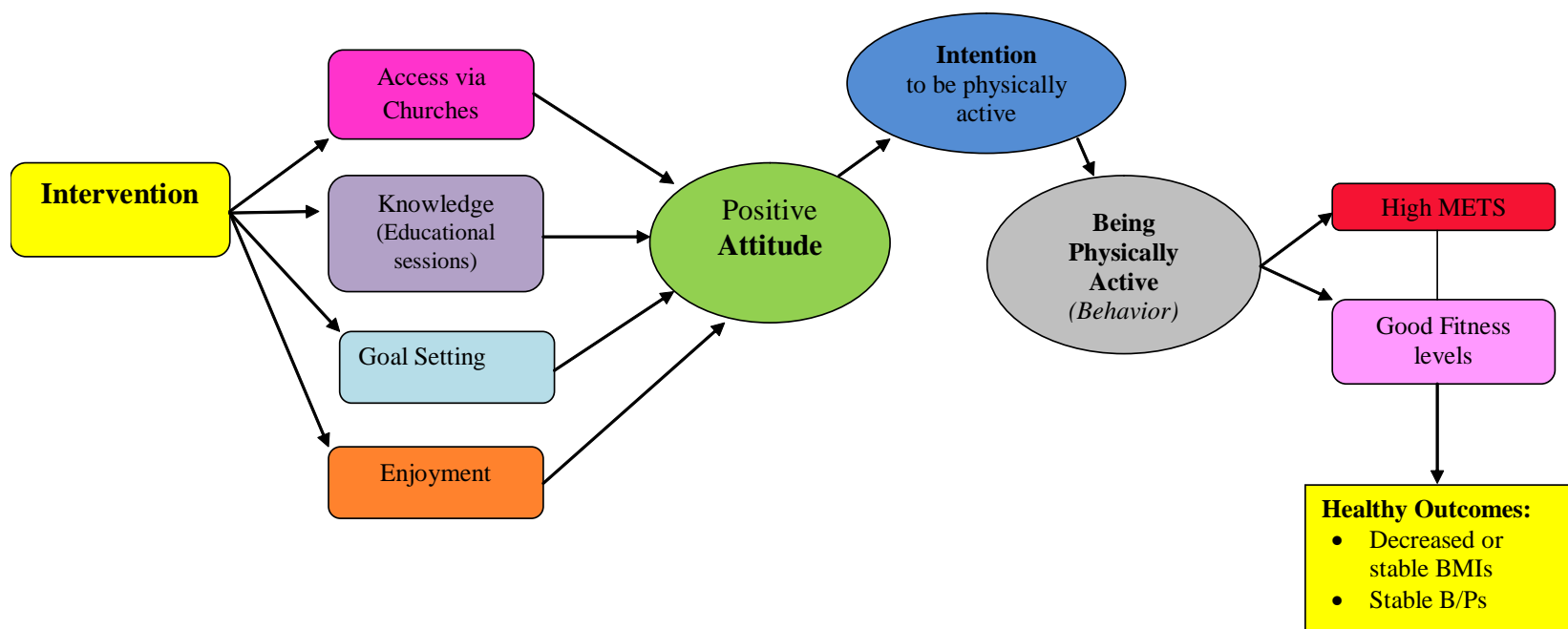


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APPENDIX D. DIAGRAM OF INTERVENTION

Diagram for Intervention based on the Theory of Reasoned Action (TRA)



What is Physical Activity?

Physical activity is defined as any bodily movement produced by skeletal muscles that result in an expenditure of energy.

Leisure-time physical activity (LTPA) is defined as physical activity performed during free time, other than work or school.

- Walking
- Dancing
- Swimming
- Jogging
- Running
- Karate
- Yard Work
- Housework
- Walking your dog
- Games (Tag, jumping rope etc.)
- Tennis
- Bicycling
- Skating
- Weight lifting
- Organized sports (Basketball, softball, soccer)



HAVE "FUN" BEING ACTIVE!



It's All About F.U.N!



Recommendation for Adolescents

Physical activity should consist of 60 minutes (1 hour) daily with most of the 60 minutes being at either moderate or vigorous intensity at least 3 days a week.

Moderate intensity is defined as working hard enough to raise your heart rate and break a sweat.

Vigorous intensity aerobic activity means one is breathing hard and fast, and your heart rate has gone up quite a bit, at this level you will not be able to say more than a few words without pausing for a breath.

LET'S GET MOVING!

Goal Setting



- Goal Setting involves establishing specific, measurable and time targeted objectives.
- It is a good way to think about what you want to do (your goal), and what it will take for you to accomplish this goal.



- By knowing precisely what you want to achieve, you know where to concentrate your efforts and energy.
- Setting and meeting your goals can be very rewarding and motivating.
- When you get into the habit of setting and reaching your goals, you will find that your self-confidence builds fast.
- By setting goals you tend to be less distracted.
- Goal setting help you to organize your time and your resources so that you can make the very most of your efforts



The steps in goal setting:

1. *State each goal as a positive statement:* Express your goals positively.
2. *Be precise:* Set a precise goal, putting in dates, times and amounts so that you can measure achievement. If you do this, you will know exactly when you have achieved the goal, and can take complete satisfaction from having achieved it.
3. *Set priorities:* When you have several goals, give each a priority. This helps you to avoid feeling overwhelmed by too many goals, and helps to direct your attention to the most important ones.
4. *Write goals down:* This helps with clarity and focus.
5. *Set realistic goals:* It is important to set goals that you can achieve.

Be SMART When Setting Goals:

S Specific
M Measurable
A Attainable
R Relevant
T Time-specific



What are the benefits to being physically active?

- ◆ Increased energy level
- ◆ Increased muscle strength
- ◆ Make you feel better
- ◆ Helps control or reduce weight
- ◆ Improved emotional well-being and self-esteem
- ◆ Reduced feelings of depression
- ◆ Decreased risk of many diseases.
- ◆ Improved health



Body Image

Real vs. Fantasy

- A mental picture or impression of how someone looks or appears to others
- A general impression that is presented or viewed by the public
- Representation of a person's appearance

Media Images of Girls and Women:

- ◆ The ideal woman's body is thin and she wears a size 4
- ◆ Celebrities have perfect skin with no flaws
- ◆ Make-up is a must
- ◆ All women dress sexy
- ◆ White women with blonde hair is the image of beauty
- ◆ You must be White to be successful



Realistic Positive Black Images: <http://www.africanamericanimages.com/>

Black Women in Sports



Serena & Venus Williams



Deanna Nolan - WNBA

Sanya Richards, Mary Wineberry, Monique Henderson, Allyson Felix



Olympic Games
August 2008
Beijing, China



Florence Griffith Joyner (Deceased)



Leila Ali

APPENDIX F. HAIR CARE TIPS FOR SISTERS ON THE MOVE

Hair Care Tips for Sisters On The Move

Feeling Fit and Looking Fine!

Some women say that concern for their hair style can get in the way of exercise. Having neat and stylish hair has always been part of our culture. We would like to offer tips to make hair care easier for active women. Engaging in physical activity may mean extra time and care for your hair. Here are some tips to follow before, during, and after exercise to keep your hair looking fine.

Working out makes you feel good and is good for you. You want neat and stylish hair because it shows a positive self attitude and makes you feel good about the way you look. Are you afraid to exercise until you sweat because your hair may "go back"? Some women report that hair concerns keep them from exercising. You can be fit and keep a beautiful hairstyle too by protecting your hair and then keeping it healthy.

You can prevent sweat damage to your hair during exercise by controlling moisture and salt buildup. Salty buildup causes your hair to break, shed, become dull, or become dry.

Care Tips

- Wash your hair with a mild, pH-balanced shampoo at least once each week to remove salt buildup.
- Condition your hair every week with moisturizing protein conditioner. A good conditioner disappears when you rub your hands together.
- Avoid over processing! Limit your use of blow dryers and curling irons.

Sisters Suggest

- Pull your hair away from your face and neck when you exercise.
- Leave part of your hair unwrapped to breathe.
- Get regular precision cuts or trims to maintain style shape.
- Talk to your hair dresser to help choose the right hair care products.
- Apply a natural oil to your scalp as needed.

When you choose a hairstyle for your active life, consider:

- Natural hairstyles hold up to frequent shampoos.
- Short hair is easy to wash and wear.
- Short hair can be dried and styled quickly or slicked back with gel.
- Locks are easy to care for.
- Long hair can be pulled back for a new look.
- Blunt cuts or Bobs look great wrapped or curled and can stay styled after workouts.
- Braids, twists, and locks also stay in place while you work out.
- Cornrow braid styles cost less and take less time to maintain than micro-braids.
- Scarves, ties or other hair accessories can be used to change a look.
- Healthy hair can be natural, relaxed or braided. Look for care tips that suit your hair style.



Natural Hair

Natural hair is strong, healthy and beautiful. It can be styled to flatter your face, your hair texture, and your daily routine.

Care tips

- Condition your hair every week with a moisturizing conditioner or hot oil treatment.
- Treat your hair and scalp with a light conditioning oil every day.
- Protect your hair when you swim by wearing a cap. If you do not use a cap be sure to shampoo or use a cream rinse after every swim session. If you choose a close cropped style, be sure to trim your hair every 4 to 6 weeks.

Styles

- Crops, Locks, Nubian knots, Twists

Sisters Suggest

To flatten the edges of your hairline, rub a cream or gel into your hands and smooth your hairline. Tie with a cotton scarf for at least 15 minutes. After you remove the scarf, your hairline will be smooth.



Braids and Weaves and More...

Braids and weaves look great, and give you many styling and color options.

Care Tips for Braids

- Don't let your hair be pulled too tight during braiding. This can result in hair loss.
- When you have braids, you will have to shampoo less often than with other styles. Frequent shampooing may lead to frizzing and loosening.
- Moisturize your scalp daily.
- Cover your hair with a silk-like scarf or bonnet when you sleep.
- Never use cholesterol-based conditioners.
- Avoid human hair extensions if you swim frequently.



Care Tips for Weaves

- Treat your weave like your own hair.
- Comb and style your weave daily.
- Avoid using gels.
- Avoid weaves with glue and adhesives.

Sisters Suggest

After a work out, you can swab your braid parts with an antiseptic and apply braid spray. When you have more time, you can use a mild shampoo and apply a leave-in conditioner.

Relaxed Hair

Relaxed hair is easy to manage and can be styled in many ways. Chemical relaxers make your hair fragile so you need to give it good extra care.

Styles

- Blunt cuts, Bobs (wrapped or curled), French twists, Ponytails, Wet sets

Sisters Suggest

- Use a wide-toothed comb to style your hair.
- Trim your hair every 6 to 8 weeks to keep your hair style shaped.

Care Tips

- Your hair grows faster in warm weather. You'll need to touch up roots more often during warm months than during cold months.
- Moisturize your scalp twice a week with a light hair oil.

When you swim, protect your hair from chlorine damage by applying an oil-based hairdress or olive oil to your hair before you get into the pool.

- When you reshape your hairstyle after a workout, dry set your hair with rollers. Apply a leave-in conditioner to the ends and use end papers.



APPENDIX G. INTERVENTION SCHEDULE

<i>Weekly Schedule of “It’s All About F.U.N!”</i>	
Pre-screening	Complete pre-surveys Obtain clinical measures (by appointment)
Week 1	Introduction and overview Distribute physical activity logs. Explain purpose and use. Topic: What is physical activity?
Week 2	Each session will start with discussing goals and accomplishments during the past week. Supporting and sharing with each other. Distribute pedometers. Explain purpose and use. 1 st dance aerobic class. (each session will end with a 30-minute aerobic dance class) Topic: Goal setting
Week 3	Take up and record readings from pedometers Give incentive for the most steps walked Topic: Identify and discuss benefits and barriers to physical activity
Week 4	Topic: Body image – real vs. fantasy. Media and public. Cultural differences.
Week 5	Topic: Women in Sports. Who is your favorite woman athlete? And why? Give a prize/incentive for reaching a set goal regarding physical activity.
Week 6 Midpoint	Schedule appointments to recollect clinical measures Turn in physical activity worksheet for the week (midpoint) No aerobic class
Week 7	Topic: The significance of family and friends to keep you active (Social Support) Send home fact sheets for parents regarding physical activity.
Week 8	Topic: Hair maintenance. <i>Hair Care Tips for Sisters on the Move</i> ("I Am Not My Hair" - a song by American soul-R&B singer India Arie) Re-distribute pedometers
Week 9	Topic: Health status of black adolescent girls and women. How not to be a statistic. Why is physical activity so important! Re-collect and record readings from pedometers
Week 10	Topic: “Girl talk”- The best way to increase physical activity is to.... (participants viewpoints)
Week 11	Review goals and accomplishments since starting the program Open discussion
Week 12 Post	Complete post-surveys Obtain clinical measures Complete program evaluation <i>Thank You for participating</i>